

3.0 AFFECTED ENVIRONMENT

Environmental impact assessment is a three-step process. The first step in Chapter 2.0 describes the proposed action and alternatives. The second step is to describe in Chapter 3.0 the environmental setting where project actions could result in environmental effects. The third step is in Chapter 4.0 Chapter 3.0 describes the affected environment and focuses on those environmental resources potentially subject to impacts. For each resource, the expected geographic scope of potential impacts, known as the region of influence (ROI), is identified and the resource is defined before the existing conditions are discussed.

3.1 AIRSPACE MANAGEMENT AND USE

The ROI for airspace management and use includes the airspace areas in which the Predator would fly. These are the NTTR airspace in Nevada including the Desert and Reveille MOAs, the R-2508 Range Complex in California, the Utah Test and Training Range (UTTR) in Utah, and Class A airspace between NTTR and the R-2508 Complex and between NTTR and the UTTR.

3.1.1 Definition of the Resource

Airspace management is defined as the direction, control, and handling of flight operations in the volume of air that overlies the geopolitical borders of the United States and its territories. Airspace is a resource managed by the Federal Aviation Administration (FAA), which has established policies, designations, and flight rules to protect aircraft in the airfield and enroute environment, in Special Use Airspace areas identified for military and other governmental activities, and other military training airspace. Management of this resource considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. Because of these multiple and sometimes competing demands, the FAA considers all aviation airspace requirements in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System (NAS) can best be structured to satisfy all user requirements.

The FAA has designated four types of airspace above the United States: Controlled, Special Use, Other, and Uncontrolled airspace. These are defined as follows:

- Controlled airspace has defined dimensions within which air traffic control service is provided to pilots operating aircraft under Instrument Flight Rules (IFR), and to Visual Flight Rule (VFR) flights in accordance with the airspace classification. Controlled airspace has five classifications: Class A, Class B, Class C, Class D, and Class E. These classes identify airspace that is controlled, airspace supporting airport operations, and designated airways affording enroute transit from place-to-place. The classes also dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.
- Special Use Airspace (SUA) is reserved for flight operations that require confinement of participating aircraft, or place operating limitations on non-participating aircraft. Restricted Areas and Military Operations Areas (MOAs) are examples of SUA.

- Other airspace consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), and Aerial Refueling Tracks (ARs). This category also includes Air Traffic Control Assigned Airspace (ATCAA). When not required for other needs, ATCAA is airspace authorized for military use by the managing Air Route Traffic Control Center (ARTCC), usually to extend the vertical boundary of SUA.
- Uncontrolled airspace is designated Class G airspace and has no specific prohibitions associated with its use.

3.1.2 Existing Conditions

Predator operations are conducted in Restricted Areas, Military Operations Areas (MOAs), Class A, and Class D airspace using a C-Band for line-of-sight or Ku-Band for beyond line-of-sight communication data links. A Restricted Area is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. Entry into a Restricted Area without approval from the using or controlling agency is prohibited. A MOA is airspace established outside Class A airspace to separate or segregate certain non-hazardous military activities from Instrument Flight Rules (IFR) traffic and to identify for Visual Flight Rules (VFR) traffic where these activities are conducted. In general, Class A airspace is that airspace from 18,000 feet above mean sea level (MSL) up to and including Flight Level (FL) 600 (approximately 60,000 feet MSL). Airspace within a 5-mile radius of ISAFAP that is not restricted is Class D airspace. Within Class A airspace, unless otherwise authorized, pilots must operate their aircraft under IFR with an appropriate Air Traffic Control (ATC) clearance.

ISAFAP is situated along and within the southern lateral boundary of the restricted airspace R-4806W. This southern lateral boundary of the airspace also coincides with the southern border of the NTTR, as shown on Figure 3.1-1. A small airfield at the Nevada Test Site, called Desert Rock Airport, is located approximately 17.5 nautical miles (nm) west of ISAFAP. Nellis AFB is located approximately 38 nm southeast of ISAFAP.

Since ISAFAP is located within R-4806W, all Predator launches occur within SUA. Most Predator training sorties would be flown in the southern portions of the NTTR (South Range) within R-4806W. The NTTR North Range and Desert and Reville MOAs are also used. Predator sorties flown in the Desert and Reville MOAs are allowed only under Visual Meteorological Conditions, and the aircraft may not enter cloud formations. Flight safety must be equal to, or greater than, that afforded by a chase aircraft accompanying the unmanned aircraft. The Air Force is required to post special notices within the Airport/Facility Direction for the southwest United States documenting the area planned for use, the UAV operation, the altitudes intended for use, and the time of the intended operation. If the time is not known, continuous use will be indicated. Predator sorties may not occur when the airspace has been released to the FAA. Under current levels of activity, 1,080 Predator sorties are flown annually in the NTTR airspace.

Predator training also occurs in the R-2508 Range Complex in California, which includes Edwards AFB, China Lake, and Fort Irwin airspace as shown on Figure 3.1-2. Predator aircraft are launched from ISAFAP and fly to the R-2508 Range Complex, which is approximately 80 nm southwest of ISAFAP. Flight outside of Restricted Areas is performed in Class A airspace, along

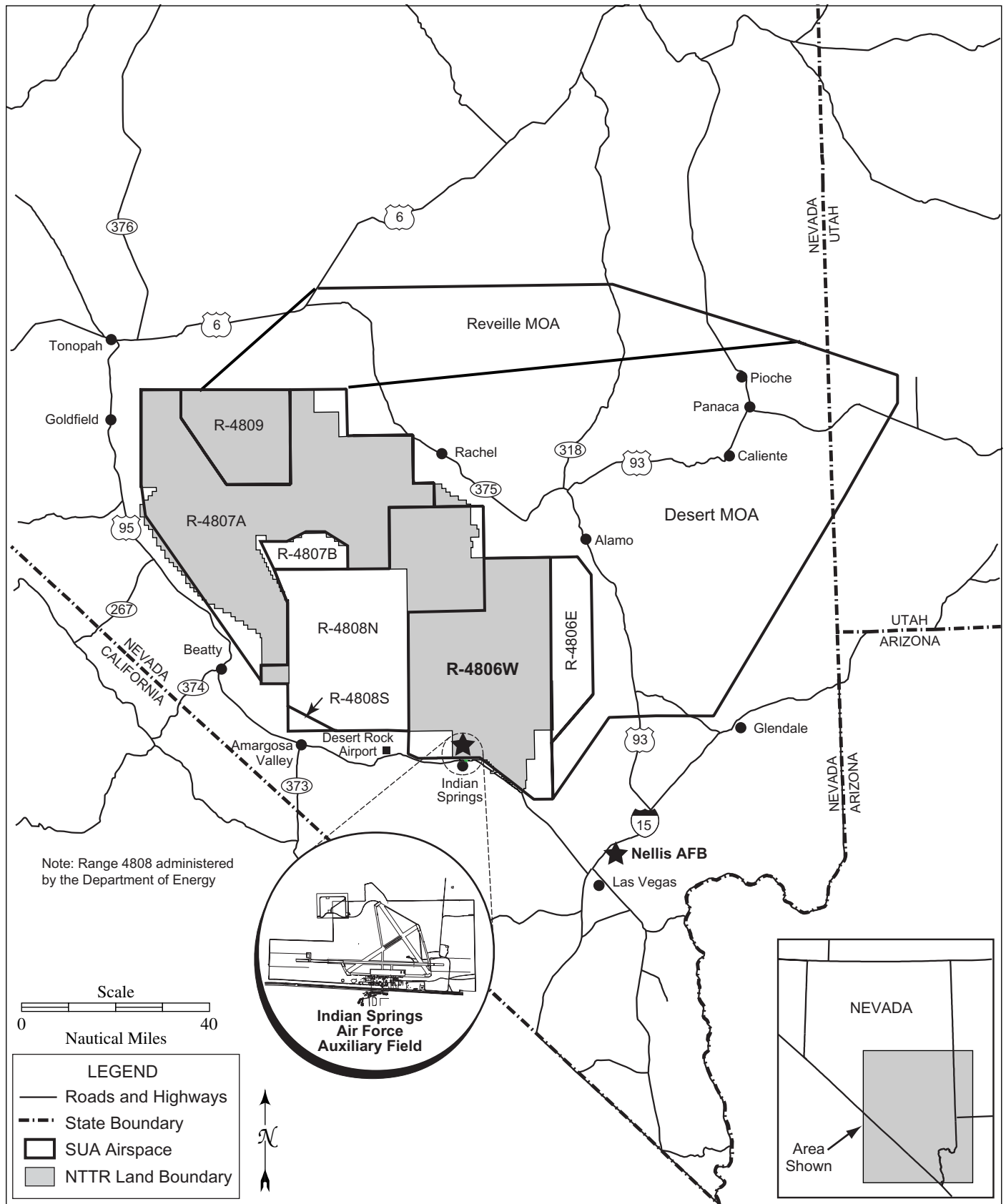


Figure 3.1-1. Nevada Test and Training Range Airspace

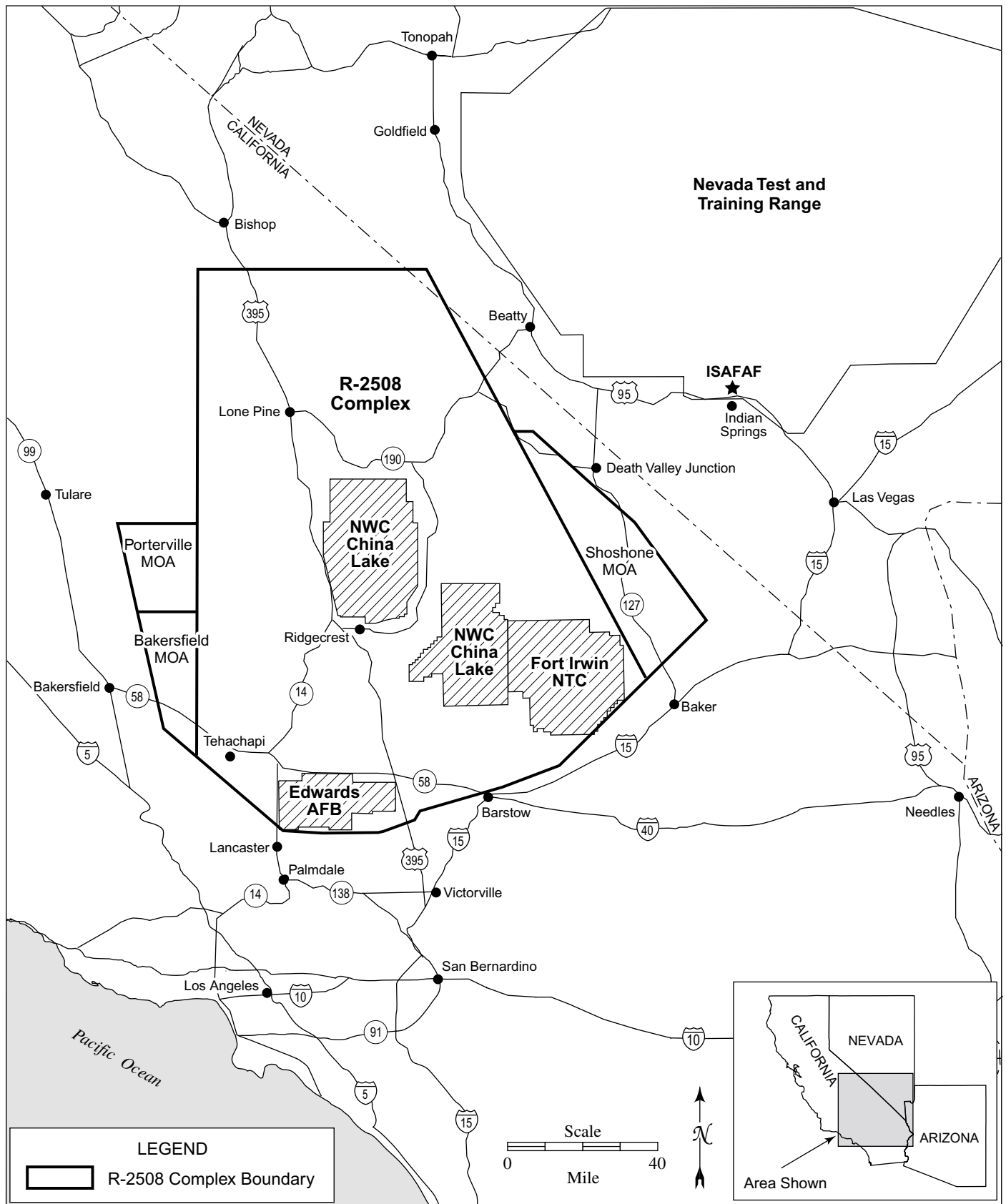


Figure 3.1-2. R-2508 Range Complex Airspace

routes that have been coordinated with the FAA and documented in a Certificate of Authorization (COA). All flight in Class A airspace is accomplished under IFR, and flight plans are coordinated and filed with the Los Angeles and/or Salt Lake City ARTCC three days in advance of the flight. Predators also have COAs to use other nearby ranges, including the UTTR. Flight between ISAFAF and the UTTR is conducted under a COA using the same procedures described for flight between ISAFAF and the R-2508 Range Complex.

The Predator aircraft are equipped with a transponder that enables tracking by the ARTCC; and they have the ability to “squawk” a specific code to the ARTCC and the ground station should a malfunction occur during flight. The designated routes avoid all military and commercial routes (personal communication, Callahan, 2003). Under current levels of activity, 174 Predator sorties are flown annually in R-2508.

3.2 SAFETY

The ROI for safety in this EA includes ISAFAF, the NTTR, R-2508, and specific segments of Class A airspace providing transit between the two airspaces. Restricted Area R-4806 supports the majority of Predator training activities in the NTTR.

3.2.1 Definition of the Resource

This section addresses ground, explosive, and flight safety associated with operations involving the Predator UAV conducted from ISAFAF, Nevada. Ground safety considers issues associated with operations and maintenance activities that support base operations, including fire and crash response. Explosive safety considers the management and use of ordnance or munitions associated with airbase operations and training activities. Flight safety considers aircraft flight risks such as aircraft accidents and bird-aircraft strikes.

3.2.2 Existing Conditions

3.2.2.1 Ground Safety

Day-to-day operations and maintenance activities conducted at ISAFAF are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements.

The fire department at ISAFAF is fully capable of responding to aircraft accidents. However, on the installation, fire protection systems are degraded for Life Safety Code deficiencies at the Visiting Officer and Airman Quarters, the Theater, the Recreation Center, and a hangar without fire suppression systems (USAF 2003). The Air Force and the community of Indian Springs are party to mutual support fire suppression agreements (USAF 2003).

Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design Criteria*, limits locations and heights of objects and facilities around and in the immediate vicinity of an airfield to minimize hazards to airfield and flight operations. Any condition not meeting these requirements is classified as an approved waiver, a permissible deviation, an exemption, or a violation (UFC 3-260-01). ISAFAF has 15 Headquarters Air Combat Command-approved

installation facilities and/or associated obstruction waivers, 14 deviations, and nine exemptions (USAF 2003).

3.2.2.2 Explosives Safety

Ordnance is handled and stored in accordance with Air Force explosive safety directives (Air Force Instruction [AFI] 91-201), and all munitions maintenance is carried out by trained, qualified personnel using Air Force-approved technical data.

Safety clearance zones protect areas where munitions are stored, maintained, and handled. These zones are geographically defined as Quantity-Distance (Q-D) arcs, and are based on the types and amounts of explosive material involved. On ISAFAF, no encroachment into these safety areas currently occurs (USAF 2003).

The armament carried by the Predator is the AGM-114 “Hellfire” air-to-ground missile. Currently, all storage and maintenance associated with this weapon system is accomplished in the weapon storage area (WSA) on Nellis AFB. When used in conjunction with Predator operations, this ordnance is transported, over approved transportation corridors (public road network) to ISAFAF. While the facilities on Nellis AFB are certified in all storage and maintenance requirements for this ordnance, they often operate at, or near capacity due to the large volume of other ordnance they must manage to support other requirements at Nellis AFB.

3.2.2.3 Flight Safety

The primary public concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with manmade structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird-aircraft strikes.

Aircraft Mishaps

The Air Force defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of \$1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than \$200,000, but less than \$1 million, result in permanent partial disability or inpatient hospitalization of three or more personnel, but do not result in fatalities. Class C mishaps involve reportable damage of more than \$20,000, but less than \$200,000, or a lost workday involving 8 hours or more away from work beyond the day or shift on which it occurred; or occupational illness that causes loss of work at any time. HAP represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and HAP, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public (USAF 2001a AFI 91-204). This EA focuses on Class A mishaps because of their potentially catastrophic results.

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The probability of an

aircraft crashing into a populated area is extremely low, however it cannot be totally discounted. Several factors are relevant: the ROI and immediate surrounding areas have relatively low population densities; the coordinated and designated aircraft routes avoid direct overflight of population centers; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleum, oils, and lubricants not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils determines how rapidly contaminants are absorbed. The specific geologic structure in the region determines the extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area would also affect the extent of contamination of those resources.

Based on historical data on mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. It should be noted that these mishap rates do not consider combat losses due to enemy action. The Class A mishap rate per 100,000 flying hours can be used to compute a statistical projection of anticipated time between Class A mishaps. In evaluating this information, it should be emphasized that those data presented are only statistically predictive. The actual causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

Since its introduction into reconnaissance support for battlefield commanders (1997), until 2002, the Predator (RQ-1) has flown approximately 31,503 hours. During that time, the aircraft has been involved in 13 Class A mishaps, which include 12 aircraft destroyed (AFSC 2003). This equates to a Class A mishap rate per 100,000 flying hours of 41.27, or one Class A mishap for every 2,423 hours flown. Analogous rates for aircraft destroyed reflect a rate of 38.09 per 100,000 flying hours, or one aircraft destroyed for every 2,625 hours flown (AFSC 2003).

A unique aspect of Predator flying operations is that the aircraft is unmanned. This means that a Predator Class A mishap has no risk to aircrew. The pilot flies the aircraft via a data-link from a ground control station. In flight, if malfunctions occur and the data-link is lost, the aircraft is programmed to return to a predetermined area within the Restricted Airspace on Nellis range. Then, it orbits while attempts are made to restore the data-link. If all fails, the aircraft simply orbits until fuel exhaustion. However, the orbit location is such that there is little or no risk to persons on the ground.

Bird-Aircraft Strike Hazards

Bird-aircraft strike hazards constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. Aircraft occasionally encounter birds at altitudes of 30,000 feet MSL or higher. However,

most birds fly close to the ground. Over 97 percent of reported bird strikes occur below 3,000 feet above ground level (AGL). Approximately 30 percent of bird strikes happen in the airport environment, and almost 55 percent occur during low-altitude flight training (AFSC 2002).

The potential for bird-aircraft strikes is greatest in bird migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, and wetlands). Migratory waterfowl (e.g., ducks, geese, and swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. Raptors and vultures also pose a strike hazard.

The bird-aircraft strike risk in the vicinity of Nellis AFB and ISAFAP is considered minor. Exposure to risk is generally limited to resident species, which exhibit generally small populations. Because of the generally inhospitable habitat in the region, few migratory species appear in the area. Sunrise Mountain and Frenchman's Peak shield the area from Lake Mead, the greatest wildlife attractant in the area (USAF 2003).

The Nellis flying safety office receives an average of fewer than 20 bird strike reports each year. Considering the level of aviation activity occurring at Nellis AFB and on the NTTR, this indicates very low risk associated with bird-aircraft strikes (USAF 2003)

3.3 NOISE

The ROI for noise includes ISAFAP and the town of Indian Springs.

3.3.1 Definition of the Resource

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although exposure to very high noise levels can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual.

3.3.2 Existing Conditions

Noise is perhaps the most identifiable concern associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is often singled out for special attention and criticism. The description of the existing noise environment projected to occur from the proposed changes and in the use of Restricted Areas requires a general understanding of sound measurement and the effects of noise on humans, animals, and structures. The following is a summary of the significant information needed to understand the information contained in this section.

In this EA, aircraft noise levels are quantified using the Day-Night Average Sound Level (Ldn). The Ldn (alternatively denoted DNL) is a cumulative metric that accounts for the total sound energy of all aircraft noise events over a 24-hour period with sound levels of nighttime (2200 to 0700 hours) noise events emphasized by adding a 10 dB weighting. The 10 dB weighting accounts for the lower ambient sound levels and greater community sensitivity to noise during

nighttime hours. When aircraft fly at low altitudes, a receptor on the ground can experience a “startle effect” because of the rapid onset of noise levels. For this reason, models that calculate noise levels for military airspace include an onset rate penalty of up to 11 dB. Such onset rate adjusted Ldn values are designated as Ldnmr.

ISAFAF Vicinity

Analysis of existing aircraft noise exposure and compatible land uses around ISAFAF was accomplished using the NOISEMAP suite of computer programs. The existing operating characteristics of ISAFAF were used with the NOISEMAP model to simulate the propagation of noise in the vicinity, and to develop noise contours. In addition to the operating data for ISAFAF presented in Chapter 2.0, aircraft approaches, departures, and closed pattern operations were assigned appropriate flight tracks, power applications, altitudes, and speeds. Consistent with the requirements of the DNL metric, all operations between 2200 and 0700 hours were assigned a 10 dB penalty to reflect heightened sensitivity during that time period. The resulting noise contours, which cover the range of noise level from 85 to 65 DNL in 5 dB increments, are presented in Table 3.3-1 along with the total area within each contour.

The Nellis-based Thunderbirds demonstration team uses ISAFAF for training and practice. ISAFAF is also used as a field for realistic military training during Flag and other exercises. Thus, the current noise environment at the airfield is dominated by F-15 and F-16 aircraft, which average 0.15 and 0.46 operations per day. Although these operating levels are quite low, they are equivalent in noise to over 600 Predator operations per day due to the dominant noise characteristics of these turbofan-powered aircraft.

Table 3.3-1. Areas within the 65 to 85 DNL Noise Contours

<i>DNL Contour Value</i>	<i>Area in Square Miles.</i>
65	0.7
70	0.5
75	0.0
80	0.0
85	0.0

Range and Vicinity

The existing noise environment has been characterized on the basis of the sound level versus distance characteristics of the Predator aircraft (composite one-engine general aviation aircraft), consistent with the methodology used in assessing the airfield.

The sound exposure level (SEL) of the Predator is compared with the SEL of an F-15A aircraft in Figure 3.3.1. The graph depicts distances ranging from 200 feet to over 20,000 feet. Distances are described as the “slant range”, which is the diagonal distance from the aircraft in the air to the observer on the ground. As depicted, the Predator SEL values are 23 to 32 dB lower than the F-15A, depending on the distance. The SEL values converge as distance increases, because there is higher atmospheric absorption for the F-15A emissions, which have a higher frequency content.

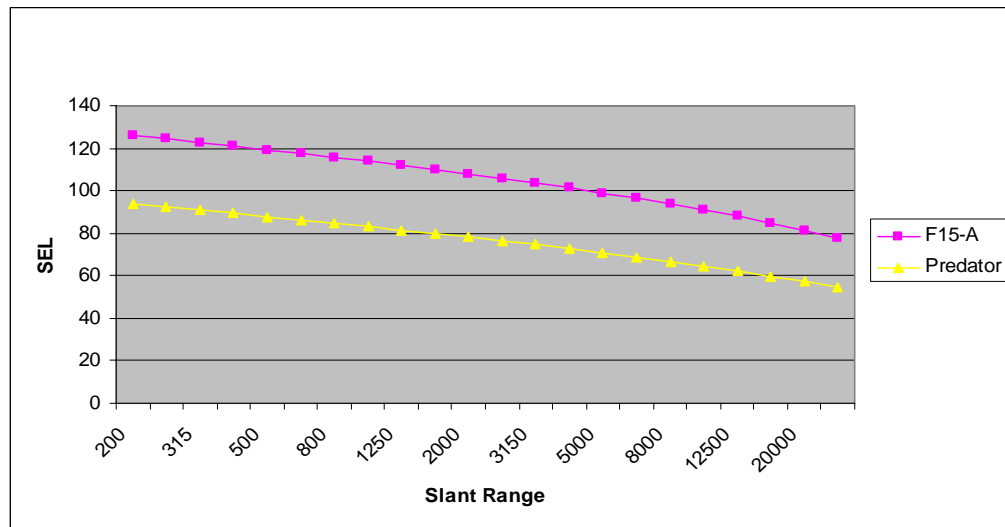


Figure 3.3-1. F-15A and Predator Noise Levels

3.4 AIR QUALITY

The ROI for air quality includes the NTTR airspace where most of the construction would occur and where Predator flights would originate and be concentrated; the R-2508 airspace (above the mixing layer) north of Edwards AFB in California, where the Predator flights would occur; and the area around Nellis AFB where three munitions storage structures would be constructed.

3.4.1 Definition of the Resource

Air quality is defined in a regulatory sense in terms of attainment status relative to national and state standards and other factors, as described below.

National Ambient Air Quality Standards

Air quality is determined by the type and concentration of pollutants in the atmosphere, size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (USEPA) has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS), represent maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM₁₀), sulfur dioxide (SO₂), and lead (Pb).

The NAAQS are defined in terms of concentration (e.g., parts per million [ppm] or micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) determined over various periods of time (averaging periods). Short-term standards (1-hour, 8-hour, or 24-hour periods) were established for pollutants with acute health effects and may not be exceeded more than once a year. Long-term standards (annual periods) were established for pollutants with chronic health effects and may never be exceeded.

In 1997, the USEPA promulgated two new standards: a new 8-hour O₃ standard (which will eventually replace the existing 1-hour O₃ standard) and a new standard for particulate matter less than 2.5 microns in diameter (PM_{2.5}), which are fine particulates that have not been previously regulated. In addition, the USEPA revised the existing PM₁₀ standard. The two new standards are scheduled for implementation over the next few years, as monitoring data becomes available to determine the attainment status of areas in the United States. Meanwhile, the USEPA will enforce the existing 1-hour O₃ standard for areas that are still in nonattainment of the standard.

State and County Air Quality Standards

Under the CAA, state and local agencies may establish ambient air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements. ISAFAF is under the local jurisdiction of Clark County Department of Air Quality Management (DAQM), the regulatory and enforcement agency in Clark County, Nevada. For the criteria pollutants of concern, Clark County AAQS are the same as the federal standards with the exception of SO₂ primary standards, which are more stringent than the federal. The federal and Nevada primary standards associated with criteria pollutants are summarized in Table 3.4-1.

Table 3.4-1. National and State Ambient Air Quality Standards

<i>Pollutant</i>	<i>Averaging Time</i>	FEDERAL NAAQS		NEVADA NAAQS
		<i>Primary</i>	<i>Secondary</i>	<i>Primary</i>
Carbon Monoxide (CO)	8-Hour 1-Hour	9 ppm 35 ppm	-- --	9 ppm 35 ppm
Nitrogen Dioxide (NO ₂)	AAM	0.053 ppm	0.053 ppm	0.053 ppm
Sulfur Dioxide (SO ₂)	AAM 24-Hour 3-Hour	0.03 ppm 0.14 ppm --	-- -- 0.5 ppm	0.02 ppm 0.1 ppm --
Particulate Matter (PM ₁₀)	AAM 24-Hour	50 µg/m ³ 150 µg/m ³	50 µg/m ³ 150 µg/m ³	50 µg/m ³ 150 µg/m ³
Particulate Matter (PM _{2.5}) ^(a)	AAM 24-Hour	15 µg/m ³ 65 µg/m ³	15 µg/m ³ 65 µg/m ³	15 µg/m ³ 65 µg/m ³
Ozone (O ₃) ^(b)	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.12 ppm --	0.12 ppm 0.08 ppm
Lead (Pb) and Pb Compounds	Calendar Quarter	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Notes: AAM = Annual Arithmetic Mean ppm = parts per million µg/m ³ = micrograms per cubic meter (a) The PM _{2.5} standard (particulate matter with a 2.5 micron diameter) was promulgated in 1997, and will be implemented over an extended time frame. Areas will not be designated as in attainment or nonattainment of the PM _{2.5} standard until the 2002 – 2005 timeframe. (b) The 8-hour ozone standard was promulgated in 1997, and will eventually replace the 1-hour standard. The USEPA plans to implement this standard beginning in 2004. During the interim, the 1-hour ozone standard will continue to apply to areas not attaining it.				

Attainment Areas

The USEPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment areas) or worse than the NAAQS (nonattainment areas). Nonattainment areas that achieve attainment are subsequently redesignated as maintenance areas for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when insufficient ambient air quality data exists for the USEPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS. The CAA Amendments (CAAA) of 1990 established a framework to achieve attainment and maintenance of the health-protective NAAQS. Title I sets provisions for the attainment and maintenance of the NAAQS.

State Implementation Plan

The CAA of 1977 set provisions for attainment and maintenance of the NAAQS. For non-attainment regions, states are required to establish a State Implementation Plan (SIP) designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring state air quality conditions into (and maintain) compliance with the NAAQS by specific deadlines. This plan is to be prepared by local agencies and incorporated into the overall SIP for each state.

The CAAA of 1990 established new federal nonattainment classifications, new emission control requirements, and new compliance dates for nonattainment areas. The requirements and compliance dates are based on the severity of nonattainment classification.

Prevention of Significant Deterioration

Section 162 of the CAA further established the goal of prevention of significant deterioration (PSD) of air quality in all international parks; national parks which exceeded 6,000 acres; and national wilderness areas which exceeded 5,000 acres if these areas were in existence on August 7, 1977. These areas were defined as mandatory Class I areas, while all other attainment or unclassifiable areas were defined as Class II areas. Under CAA Section 164, states or tribal nations, in addition to the federal government, have the authority to redesignate certain areas as (non-mandatory) PSD Class I areas, *i.e.*, a National Park or national wilderness area established after August 7, 1977, which exceeds 10,000 acres. PSD Class I areas are areas where any appreciable deterioration of air quality is considered significant. Class II areas are those where moderate, well-controlled growth could be permitted. Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have yet been so designated. The PSD requirements affect construction of new major stationary sources in the PSD Class I, II, and III areas.

Visibility

CAA Section 169A established the additional goal of prevention of further visibility impairment in the PSD Class I areas. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area is typically associated with evaluation of stationary source contributions. The USEPA is implementing a Regional Haze rule for PSD Class I areas that will address

contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to qualitatively assess potential impairment to visibility in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of PM₁₀ and SO₂ in the lower atmosphere.

General Conformity

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies to demonstrate conformity of proposed activities with the local SIP. In 1993, the USEPA issued final rules for determining air quality conformity. Federal activities must not:

- (a) cause or contribute to any new violation;
- (b) increase the frequency or severity of any existing violation; or
- (c) delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS.

General conformity applies only to nonattainment and maintenance areas. If emissions from a federal action proposed in a nonattainment area would exceed annual thresholds identified in the rule, a conformity determination is required of that action. The thresholds become more restrictive as the severity of the nonattainment status of the region increases (70 tons per year of PM₁₀ or 100 tons per year of CO for CO and PM₁₀ serious nonattainment areas).

3.4.2 Existing Conditions

3.4.2.1 Climate and Meteorology

ISAFAP and Nellis AFB are located in southern Nevada, between the Sierra Nevada Mountains of California and the Springs Mountains immediately west of the Las Vegas Valley. The climate is characterized by hot and dry summers and mild winters. The summer heat is tempered somewhat by the extremely low relative humidity. However, occasional moist winds from the south, typically during the months of July and August, bring spectacular desert thunderstorms that are frequently associated with significant flash flooding and/or strong downburst winds. Daily high temperatures in the summer typically exceed 100 degrees with lows in the 70s.

Winters are generally mild and pleasant. Afternoon temperatures average near 60 degrees and skies are mostly clear. Pacific storms occasionally produce rainfall in Las Vegas, but in general the mountains on the east and west of Las Vegas Valley act as effective barriers to moisture. The average annual precipitation is 4.13 inches. Snow accumulation is normally rare in the Las Vegas area. Flurries are observed once or twice during most winters, but snowfall of 1 inch or more occurs only once every 4 to 5 years.

The spring and fall seasons are generally considered ideal. Although some sharp temperature changes can occur during these months, outdoor activities are seldom hampered.

Strong winds are the most persistent weather hazard in the area. Winds can occasionally reach over 50 miles per hour with some of the more vigorous storms. Winter and springs winds often generate widespread areas of blowing dust and sand. Strong winds in the summer are usually

associated with thunderstorms, and are thus more isolated and localized. Prevailing wind direction is typically southwest, unless associated with a thunderstorm outflow.

3.4.2.2 Regional Air Quality

ISAFAF is located in the northwestern portion of Clark County, in Southern Nevada. Nellis AFB is located in central Clark County, just northeast of Las Vegas. The Clark County Department of Air Quality Management is the regulatory and enforcement agency in Clark County, Nevada. A major portion of Clark County, the Las Vegas Valley hydrographic area, is designated as "serious" nonattainment for CO and PM₁₀, and attainment or meeting national standards for the remaining criteria pollutants, including NO₂, SO₂, O₃, and Pb. Nellis AFB is located in the serious nonattainment area of Clark County, while ISAFAF is located just outside of it. Figure 3.4-1 illustrates the relationship of the Clark County CO and PM₁₀ nonattainment area to the NTTR airspace. Based on recent monitoring data, Clark County is expected to be designated as a nonattainment area for the new 8-hour ozone standard when the EPA makes its designations, which is expected to occur in 2004.

Mandatory PSD Class I areas established under the CAAA of 1977 for the state of Nevada are listed in 40 CFR 81.418. These are areas where visibility has been determined to be an important issue by the Administrator, in consultation with the Secretary of the Interior. The nearest mandatory PSD Class I area to the region potentially affected by the action alternatives is the Grand Canyon National Park, located in Arizona, approximately 100 miles east of ISAFAF.

For the R-2508 airspace, all flights would occur above the mixing layer; hence, the air basins beneath the mixing layer are not part of the ROI, and the ground-level air quality would not be affected by Predator flights above the mixing layer.

3.4.2.3 Current Air Emissions

Current ground-level air emissions at ISAFAF and Nellis AFB are from mobile and stationary sources. The mobile sources include aircraft operations, ground support equipment, and motor vehicles. Examples of stationary sources include boilers, emergency generators, military gas stations, rock crushing operations, and surface coating operations. The 2002 air emissions inventory for stationary sources at ISAFAF and Nellis AFB is summarized in Table 3.4-2.

Table 3.4-2. 2002 Emissions Inventory for Stationary Sources (in tons per year)

<i>Location</i>	<i>CO</i>	<i>SO_x</i>	<i>NO_x</i>	<i>PM₁₀</i>	<i>VOC</i>
ISAFAF	0.38	1.01	1.78	13.54	9.28
Nellis AFB	24.67	4.36	31.47	36.66	13.67
Sources: Nellis AFB Environmental Management 2003a and 2003b					

3.5 GEOLOGY AND SOIL

The ROI for geology and soil includes the sites and immediate vicinities where construction or ground disturbance would occur as a result of project-related actions.

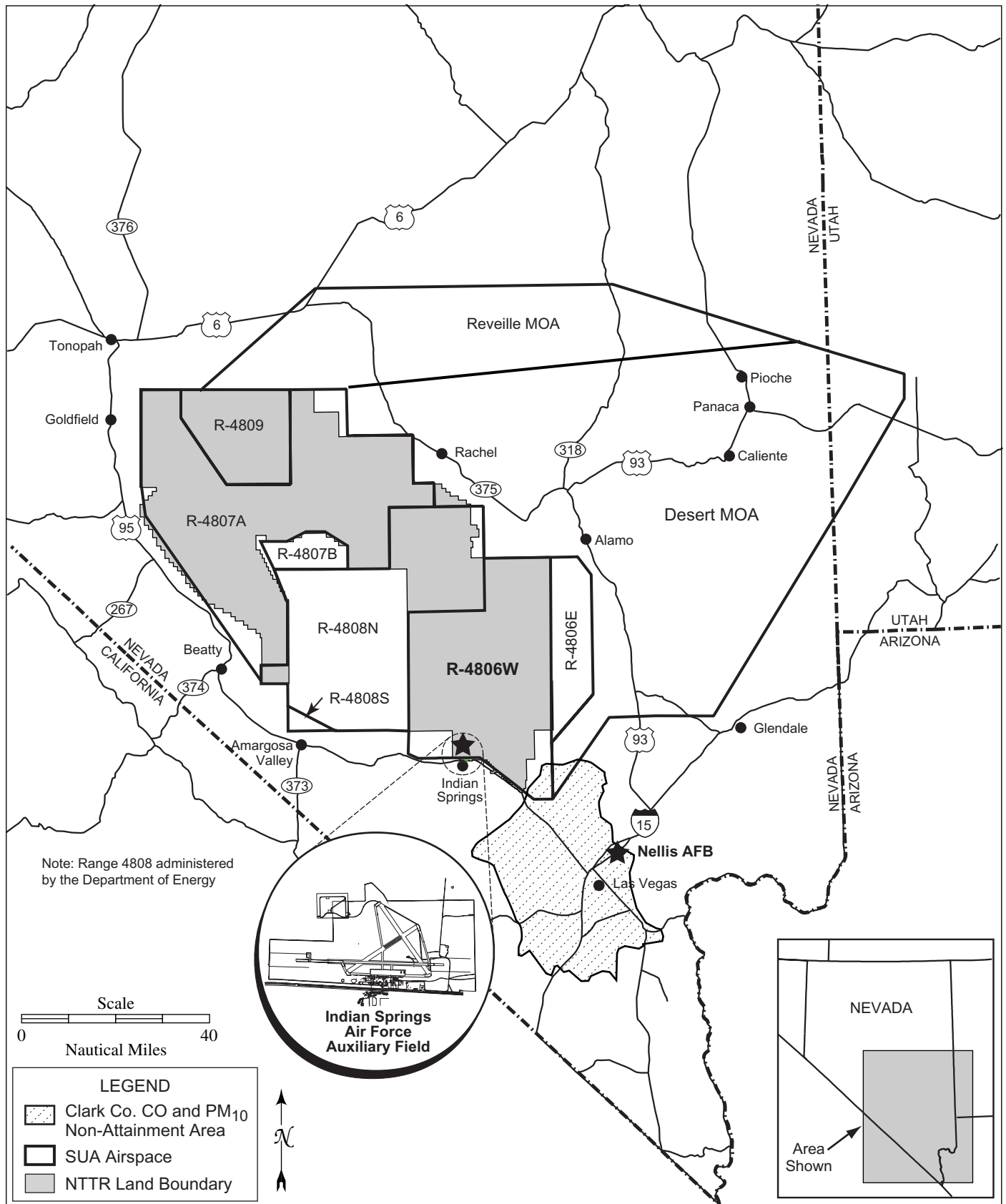


Figure 3.4-1. Relationship of Clark County CO and PM₁₀ Nonattainment Area to the NTTR Airspace

3.5.1 Definition of the Resource

Geologic resources refer to earth processes or elements that could be potentially affected by the proposed project and include geology, topography, seismicity, and soils. This section describes the geological resources present on and in the vicinity of ISAFAF. Additionally, a discussion of geologic resources at the Nellis MSA site is included.

3.5.2 Existing Conditions

Geology and Topography

ISAFAF is located within the southern part of the Great Basin, the northernmost subprovince of the Basin and Range Physiographic Province (Hunt 1974). The Great Basin is characterized by steep, north-trending mountain ranges that are separated by vast alluvial basins. The entire region, including the project area, generally drains internally, and has no surface water outlet (USAF 1999).

Elevations in the vicinity of ISAFAF range from approximately 3,000 feet (914 meters), in the Indian Springs and Three Lakes Valleys, to over 6,000 feet (1,829 meters), in the Pintwater and Spotted Ranges (USAF 1999). The topography of the region is typical of the Great Basin and can be described as high, thin mountain ranges with alluvial basins in between. The ranges are comprised of block-faulted mountains formed by massive Paleozoic carbonate rocks that rise abruptly from flanking bajadas (coalescing alluvial fans) (USAF 1999). The valleys are deep alluvial basins with source material originating from adjacent ranges (Pintwater and Spotted ranges). Desert playas (dry lakebeds) are also present throughout the region.

ISAFAF is located in the southern opening of the Indian Springs Valley. The valley is bound by the Spotted Range and Buried Hills to the west and the Pintwater Range to the east. The valley areas are dominated by Quaternary alluvial deposits with patches of Quaternary playa and marsh deposits north of ISAFAF. The local mountains (southern Pintwater Range and Spotted Range) are primarily Paleozoic limestone, dolomite, shale, and quartzite (USAF 1999). Due primarily to the western winds, the western sides of the mountains in the area are commonly flanked by dunes on top of deep alluvial fans (USAF 1999).

No known faults underlie ISAFAF, and the majority of the faults in the vicinity are considered inactive. The only known active fault in the area is the Yucca fault, located approximately 20 miles northwest at the southern border of North Range. The Yucca fault is considered active based on displacement of Holocene and Pleistocene alluvium by as much as 60 feet. Offsets of such young deposits are indicative of fault movement within the last few thousand to tens of thousands of years. Subsurface displacement along this fault has been determined to be approximately 700 feet (USAF 1999). Inactive or potentially active faults in the area include the Pahrnagat fault (approximately 20 miles northeast), which displays Quaternary fault movement (during the past 2 million years).

ISAFAF is located within Seismic Zone 2B, as identified in the Uniform Building Code (ICBO 1991). Zone 2B, on a scale of 1 to 4, is defined as an area of moderate damage potential. Current design standards require facilities to be built to Seismic Zone 4 standards (USAF 1999).

An area in the northwest corner of ISAFAF is located within a 100-year flood plain (Zone II, T-2). Areas within the 100-year floodplain are defined as having a 1 percent chance of being inundated by floodwaters for any given year.

At the Nellis MSA site, topography consists of both gently and sharply inclined hills. The site is dominated by Quaternary alluvium with angular volcanic rock fragments intermixed. The area is generally undisturbed with the exception of munitions storage facilities to the north and Perimeter Road to the south.

The nearest faults to the Nellis MSA site are the California Wash fault zone, located approximately 10 to 30 miles (16 to 48 km) to the northeast, and the Eglington fault, located approximately 15 miles (24) to the west. The United States Geological Survey (USGS) identifies the California Wash fault as capable of producing a magnitude 7.0 earthquake on the Richter scale and the Eglington fault as capable of producing a magnitude 6.3 earthquake (USGS 2001).

Soils

Soils in the vicinity of ISAFAF have not been mapped in detail. Soil information for the area is based on general descriptions from various resource surveys, geologic studies in adjacent areas, and general observations. A geotechnical report will be prepared for ISAFAF as part of the pre-construction planning and design phase. The following summary of soils in the vicinity of ISAFAF is based on the aforementioned reports and observations.

Soils in the area are aridisols developed in carbonate parent material from local mountains (USAF 1999). Aridisols generally have poorly developed A horizons with clear B and C horizons and are sandy, loose, and prone to erosion in areas not protected by desert pavement. Soils can form anywhere that sediments accumulate; however, soils develop very slowly in desert environments and are easily disturbed. Much of the area has a surface crust known as desert pavement, which is an armored surface crust of packed angular to sub-rounded rock fragments covering the soils surface. Desert pavement is common to arid environments and acts as a shell to softer, more vulnerable soils below. Lenses of caliche (sediment cemented together with sodium salts) and clay are also known to be present at depth (USACE 2003).

Soils at the Nellis MSA site are predominately well-drained, undisturbed sandy loam with intermixed Tertiary volcanic angular fragments.

3.6 WATER RESOURCES

The ROI for water resources includes surface and groundwater resources within the near vicinity of ISAFAF.

3.6.1 Definition of the Resource

Water resources include surface and groundwater, as well as characteristics of the water supply system of ISAFAF.

3.6.2 Existing Conditions

Surface Water

Natural surface water is scarce on and around ISAFAF. The dry desert regional climate of the area is characterized by low precipitation and humidity, high evaporation, and wide extremes in daily temperatures (USAF 1999). Average annual precipitation at ISAFAF is approximately 4 inches; however, the area is susceptible to locally intense thunderstorms that can produce flash floods. Flash floods produce high peak flows over short periods of time.

Most of the surrounding area drains internally, i.e., surface water runoff does not ultimately flow to the ocean. Surface flow is primarily towards the two local playas, located north of the Air Field where it collects and evaporates. Playas are not substantial recharge zones due to low infiltration and high evaporation rates. Evaporation rates in the area are very high and have been estimated at approximately 58 to 69 inches per year (USAF 1999).

Other than constructed ponds and structures, no permanent surface water occurs on or in the vicinity of ISAFAF. Surface water in the vicinity of ISAFAF flows through braided, ephemeral streams, which usually flow for brief periods immediately following precipitation events.

Groundwater/Water Supply

Potable water is supplied to ISAFAF from three active wells located within the Air Field boundaries (Well 62-1, Well 106-2, and ISAFAF Well 3). Pumped groundwater is chlorine-treated before entering the base distribution system (USAF 1998). The Air Force has authorization from the State of Nevada Engineer to pump a total of approximately 193 acre-feet per year (AFY) or 62.7 million gallons per year (gpy) from these wells. Specific annual allocations for each well are presented in Table 3.6-1.

Table 3.6-1. Annual Allocations for ISAFAF Wells

<i>Well</i>	<i>Municipal Allocation in AFY (million gpy)</i>	<i>Industrial Allocation in AFY (million gpy)</i>	<i>Total Allocation in AFY (million gpy)</i>
Well 62-1	68 (22.2)	18.32 (6.0)	86.35 (28.1)
Well 106-2	35.5 (11.6)	50.75 (16.5)	86.25 (28.1)
ISAFAF Well 3	-	20.00 (6.5)	20.00 (6.5)
Total	103.5 (33.7)	89.07 (29.0)	192.57 (62.7)
<i>Source:</i> Compiled from <i>Water Requirements Study of the Nellis Air Force Range</i> (USAF 1998). 1 AF = 3.259x10 ⁵ gallons.			

Current demand on the ISAFAF water supply system is estimated at an annual average of 88,000 gallons per day (gpd) (approximately 32 million gpy or 98.6 AFY). The ISAFAF General Plan identifies the current water supply at ISAFAF as adequate yet stressed (USAF 2003).

Water supply on Nellis AFB and surrounding communities is supplied by Southern Nevada Water Authority (SNWA) and is complemented by nine potable water wells on or near the base (USAF 2003). Approximately 80 percent of the base water supply is provided by SNWA. Current supply at Nellis AFB is considered adequate (USAF 2003).

Groundwater Quality

Groundwater in the region is high in total dissolved solids (TDS) at levels of 500-1,000 mg/l and rich in calcium and magnesium bicarbonate; however, the groundwater is well within the EPA standards for drinking water quality (USAF 2002a).

3.7 BIOLOGICAL RESOURCES

The ROI for biological resources includes (1) the immediate vicinity of ISAFAF, where ground disturbance would occur and low-level aircraft activity would increase; and (2) the area of proposed new storage bunkers within the existing munitions storage area (MSA) at Nellis AFB.

3.7.1 Definition of the Resource

Biological resources include plants and animals and the habitats in which they occur. Habitats are defined on the basis of a combination of physical (location, elevation, climate, geology, hydrology) and biological (plant and animal species) features that occurs with some consistency or pattern within the region of interest. Vegetation, consisting of one or more distinct plant communities or associations with one-to-few dominant species, is particularly important as it often indicates the potential suitability of the habitat for particular plant or wildlife species, including those with special status (e.g., species listed under the Endangered Species Act). For the purposes of this analysis, biological resources are presented in two categories: 1) Vegetation and Wildlife and 2) Special Status Species.

3.7.2 Vegetation and Wildlife

Vegetation

The ISAFAF lies within the northeastern portion of the Mojave Desert at an elevation of approximately 3,120 feet. The surrounding landscape is typical of the Mojave Desert, with low-lying enclosed basins surrounded by low mountains and bajadas formed of coalescing alluvial fans. On the bajadas and mountain slopes, the vegetation is typically dominated by creosote bush (*Larrea tridentata*), with which white bur-sage (*Ambrosia dumosa*) is commonly co-dominant. Additional associates include saltbushes (*Atriplex* spp.), Mormon tea (*Ephedra* spp.), brittlebush (*Encelia virginensis*), desert mallow (*Sphaeralcea ambigua*), cholla and prickly pear cacti (*Opuntia* spp.), and Mojave yucca (*Yucca schidigera*). At higher elevations (~4,000 feet), Joshua tree (*Yucca brevifolia*) becomes prevalent. On valley bottoms and dry lake beds (playas) at lower elevations, where soils are relatively fine, alkaline and clayey, saltbushes, including four-wing saltbush (*Atriplex canescens*), shadscale (*A. confertifolia*), and allscale (also called cattle spinach) (*A. polycarpa*) dominate the vegetation. Matchweed (*Gutierrezia sarothrae*), buckwheat (*Eriogonum* spp.), and cheesebush (*Hymenoclea salsola*) also occur in saltbush scrub in the study area (Dames & Moore 1996a). Between these two primary vegetation types or ecosystems, local communities and associations dominated by different combinations of the above species and associated wildlife may be differentiated (Clark County 2000; USFA 1998; Dames & Moore 1996a). Around springs and drainage bottoms are found honey mesquite (*Prosopis glandulosa* var. *torreyana*), catclaw (*Acacia gregii*), cattle spinach, and introduced salt cedar (*Tamarix* spp.). Fan palms (*Washingtonia* spp.) and a variety of non-native species are commonly planted in

developed areas. Highly disturbed sites tend to be dominated by introduced species such as Russian thistle (*Salsola kali*).

Vegetation surrounding the ISAFAF was systematically evaluated and mapped by Dames and Moore (1996a) and is shown in Figure 3.7-1. Mixed scrub vegetation typical of the Mojave Desert occurs on lands surrounding ISAFAF, where several associations including creosote bush, bur-sage, and different species of saltbush can be distinguished (Dames & Moore 1996a).

Within the fenced area of the airfield, the vegetation is very sparse due to disturbance and is dominated by non-native Russian thistle. Surrounding vegetation and wildlife habitat outside of the fence consists of creosote bush scrub and saltbush scrub (Figure 3.7-1; Dames & Moore 1996a). Two different associations of creosote bush scrub are recognized: one dominated by creosote bush and white bursage, occurring to the southwest to southeast and to the south surrounding Indian Springs; and another including a mixed scrub association of creosote bush, fourwing saltbush, and shadscale, throughout the area north of ISAFAF. The saltbush scrub occurs on the northeast side of the airfield.

Surface water occurs outside the project area at the municipal sewage ponds to the east along Highway 95, and at several springs in the Indian Springs Valley (USAF 1999). These areas are valuable wildlife habitats (USAF 1999; Dames & Moore 1997a,b); but would not be affected by the project.

The area on Nellis AFB where the new storage bunkers would be constructed is within the fenced MSA and consists of low, rocky hills over which Tertiary volcanic rocks are interspersed with younger alluvium. Vegetation on site is comprised of creosote bush scrub, with widely spaced shrubs interspersed with a number of low growing grasses and forbs. Isolated individual shrubs present include creosote bush, white bur-sage, and saltbush with several associates including Mormon tea and desert mallow. Cacti are rare, and Mojave yucca are virtually absent from the site and surrounding region.

Wildlife

Wildlife that typically occur in creosote bush scrub and saltbush scrub habitats, and are known or expected to occur in the project areas on ISAFAF and Nellis AFB, primarily outside of the fences, are as follows (Dames & Moore 1996a; USAF 1997, 1999):

1. A diverse herpetofauna that includes desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callosaurus draconoides*), side-blotched lizard (*Uta stansburiana*), horned lizards (*Phrynosoma* spp.), western whiptail (*Cnemidophorus tigris*), and the desert tortoise (*Gopherus agassizii*). Several snakes may also be present, including kingsnake (*Lampropeltus getulus*), rosy boa (*Lichanura trivirgata*), gopher snake (*Pituophis melanoleucus*), and Mojave rattlesnake (*Crotalus scutulatus*).
2. Birds that include a variety of ground-dwelling seed or insect eaters such as jays, wrens, shrikes, towhees, sparrows, Gambel's quail (*Callipepla gambelii*), sage thrasher (*Oreoscoptes montanus*) and mourning dove (*Zenaida macroura*); the omnivorous raven (*Corvus corax*); greater roadrunner (*Geococcyx californianus*), which feeds on snakes and lizards; and several species of raptors, including golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and northern harrier

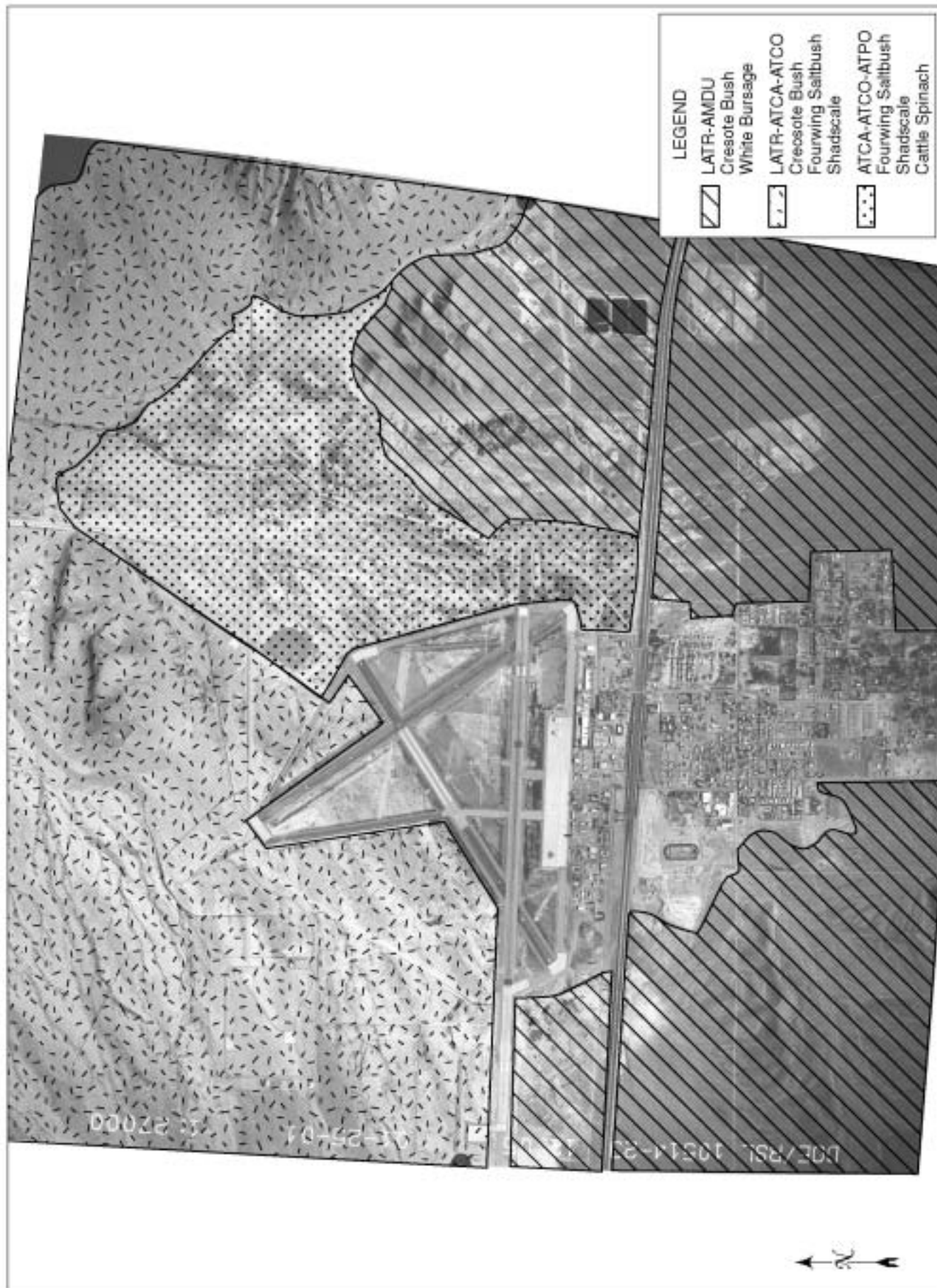


Figure 3.7-1. Vegetation Surrounding ISAFAF

(*Circus cyaneus*). Burrowing owls (*Athene cunicularia hyugea*) occur at the northern end of the runways at ISAFAF (Dames & Moore 1996a).

3. Mammals that include black-tailed jackrabbits (*Lepus californicus*), desert woodrat (*Neotoma lepida*), kangaroo rats (*Dipodomys* spp.), coyote (*Canis latrans*), and desert kit fox (*Vulpes macrotis arsipus*). Several species of bats may occur in the general area, attracted by water and associated insects at the municipal sewage ponds and the springs in Indian Springs Valley (Dames & Moore 1997a). Pipistrelle (*Pipistrellus hesperus*) and California myotis (*Myotis californicus*) were documented in surveys at Indian Springs (Dames & Moore 1997a).

3.7.3 Special Status Species

Special status species include federally listed threatened and endangered species, candidates for such listing, and “species of concern” as identified by the U.S. Fish and Wildlife Service (USFWS). Species of concern may also include Nevada state-listed species. The USFWS (Appendix A) has provided information on special status species that potentially occur in the project vicinity at ISAFAF; these species may also occur in the vicinity of Nellis AFB. These special status plant and wildlife species, including information on occurrence and habitat affinities, are listed in Tables 3.7-1 and 3.7-2, respectively. A formal Section 7 consultation with USFWS is in progress for all of NTTR, including ISAFAF.



**ISAFAF is adjacent to the Desert National Wildlife Range.
Within and adjacent to the fenced area, the vegetation
is very sparse due to past disturbance.**

Table 3.7-1. Special Status Plant Species Potentially Occurring in the ROI¹

Scientific Name Common Name	Regulatory Status ²	Heritage Rank ³	Description, Flowering Period	Distribution and Habitat (reference)
<i>Arctomecon californica</i> Las Vegas bearpoppy	SOC, CE	G3S3	Cespiteous perennial herb, with 6-20 yellow flowers on each stalk; flowers April-May	Clark County; reported on NAFB. On barren slopes, flats, and hummocks, often on gypsum soils, in creosote bush scrub, 1,310-2,760 feet (Mozingo and Williams 1980).
<i>Arctomecon merriamii</i> Merriam's bearpoppy	SOC, BLM	G3S2	Clumped perennial herb, with white flowers borne singly on stalks; flowers April-June	Clark, Lincoln, and Nye counties, on NTTR with 40 populations on South Range, including locations along the east side of ISAFAF. Shallow gravelly soils, limestone outcrops, flats and dry lakebeds, in various Mojave Desert scrub communities, 2,000-6,300 feet (Mozingo and Williams 1980; Dames & Moore 1996a; TNC 1997).
<i>Astragalus nyensis</i> Nye milkvetch	SOC	G3S3	Slender, diffuse annual herb; flowers April-May	Clark, Lincoln, and Nye counties, on outwash fans and gravelly flats, sometimes in sandy soil, in creosote bush scrub vegetation, 1,100-5,600 feet. (Mozingo and Williams 1980; Nevada Natural Heritage Program 2001).
<i>Eriogonum heermannii</i> var. <i>clokeyi</i> Clokey buckwheat	SOC, BLM, USFS	G5T2S2	Low, shrubby perennial, with erect stems arising from prostrate branches; flowers late spring- summer	Clark and Nye counties, carbonate outcrops, talus, scree, and gravelly washes and banks, in creosote bush scrub, shadscale, and blackbrush vegetation 4,000-6000 feet (Nevada Natural Heritage Program 2001).
<i>Perityle intricata</i> Delicate rockdaisy	SOC, BLM	G3Q3S3	Subshrub; flowers late spring-early fall	Clark, Lincoln, and Nye counties, in crevices and rubble of carbonate outcrops in the shadscale, blackbrush, and mixed shrub zones, 2,620-6,000 feet; occurrences north and west of ISAFAF. (Nevada Natural Heritage Program 2001).
<i>Phacelia filae</i> Clark phacelia	SOC	?	Diminutive annual herb; flowers April-May	Clark, Lincoln, and Nye counties, newly discovered species resembling <i>Phacelia beatleyae</i> presumed to have similar habitat affinities, potentially occurring on gravel or volcanic tuff, along washes and in canyons, also on slopes. In barren areas, creosote bush scrub, shadscale scrub, 2,500-5,800 feet (Atwood et al. 2002).
<p>Notes:</p> <ol style="list-style-type: none"> Based on correspondence from U.S. Fish and Wildlife Service, March 17, 2003. Includes species that are known from the general vicinity of ISAFAF. Status abbreviated as follows: Federal Status FC = Candidate for federal listing as threatened or endangered SOC = Federal Species of Concern, indicating former candidate status and potential for reconsideration in the future. BLM = listed on Nevada BLM Sensitive Species List (4/97). TNC Rankings (TNC 1997) abbreviated as follows: G = Global rank indicator, based on worldwide distribution at the species level T = Trinomial rank indicator, based on worldwide distribution at the infraspecific level S = State rank indicator, based on distribution within Nevada at the lowest taxonomic level Q = Taxonomic status questionable or uncertain 1 = Critically imperiled due to extreme rarity, imminent threats, or biological factors 2 = Imperiled due to rarity or other demonstrable factors 3 = Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction 4 = Apparently secure, though frequently quite rare in parts of its range, especially at the periphery 5 = Demonstrably secure, though frequently quite rare in parts of its range, especially at the periphery 				

Table 3.7-2. Special Status Wildlife Species Potentially Occurring in the ISAFAF Vicinity
(page 1 of 2)

(page 1 of 2)

Species	STATUS		Habitat, Potential Occurrence on ISAFAP (Reference)
	Federal	State	
LISTED SPECIES			
Desert tortoise (<i>Gopherus agassizii</i>)	T	T	Present in low densities throughout Mojave Desert scrub. Occurs on land around ISAFAP, unlikely but possible in disturbed airfield area (Dames & Moore 1996a). Known to occur at the MSA (personal communication, J. Campe).
SPECIES OF CONCERN			
Mammals			
Townsend's big-eared bat (<i>Plecotus townsendii</i>)	SOC, BLM		Roosts in caves, mines and buildings, widely distributed. Possible in vicinity of ISAFAP and elsewhere on NTTR (Dames & Moore 1997a).
Spotted bat (<i>Euderma maculatum</i>)	SOC	T	Found in various habitats from desert to mountain coniferous forest but always in association with nearby high cliff faces. Unlikely to occur on ISAFAP due to lack habitat and water (Dames & Moore 1997a).
Greater western mastiff bat (<i>Eumops perotis californicus</i>)	SOC		Inhabits rugged canyons with caves, rock crevices, also in buildings. In Nevada, not known to occur north of Las Vegas, therefore unlikely on ISAFAP (Dames & Moore 1997a).
Allen's big-eared bat (<i>Idionycteris phyllotis</i>)	SOC, BLM		Typically associated with sagebrush, pine and oak forests. Roosts in caves. No habitat on ISAFAP (Dames & Moore 1997a).
California leaf-nosed bat (<i>Macrotus californicus</i>)	SOC, BLM		Found in arid lowlands, desert scrub vegetation of the Sonoran and Southern Mojave Deserts. Colonial, roosts in caves and abandoned buildings. Unlikely to occur at ISAFAP, which is north of known range limit (Dames & Moore 1997a).
Small-footed myotis (<i>Myotis ciliolabrum</i>)	SOC, BLM		Occurs in a variety of habitats, but most common in arid environments at middle to upper elevations; roosts primarily in caves, buildings, mines, or crevices. Unlikely on ISAFAP due to low elevation, lack of water (Dames & Moore 1997a).
Long-eared myotis (<i>Myotis evotis</i>)	SOC, BLM		Occurs primarily in forests, but also less frequently in sagebrush and chaparral habitats. Roosts in cracks in cliffs, hollow trees, caves, mines, and buildings. Not likely on ISAFAP due to low elevation, lack of water (Dames & Moore 1997a).
Fringed myotis (<i>Myotis thysanodes</i>)	SOC, BLM		Found in sagebrush, shrub-steppe, oak- pinyon, and coniferous forest habitats. Roosts in caves, rock crevices, and buildings. Not likely on ISAFAP due to low elevation, lack of water (Dames & Moore 1997a).
Cave myotis (<i>Myotis velifer brevis</i>)	SOC, BLM		Reaches northern limit in southern Clark County; maternity and nursery colonies in mines, caves, under bridges, migrates south during winter. Occurs in desert scrub, but always near water. Not known or expected on ISAFAP (Dames & Moore 1997a).

Table 3.7-2. Special Status Wildlife Species Potentially Occurring in the ISAFAF Vicinity
(page 2 of 2)

<i>Species</i>	STATUS		<i>Habitat, Potential Occurrence on ISAFAF (Reference)</i>
	<i>Federal</i>	<i>State</i>	
Long-legged myotis (<i>Myotis volans</i>)	SOC, BLM		Typically associated with montane forests but also found in riparian and desert habitats. Roosts in rock crevices in cliffs, cracks in ground, behind loose bark on trees and in buildings. Unlikely at ISAFAF due to low elevation, lack of habitat (Dames & Moore 1997a).
Yuma myotis (<i>Myotis yumanensis</i>)	SOC, BLM		Found in areas with trees adjacent to open water. Roosts in caves, tunnels and buildings. Known from Spring Mountains, but unlikely at ISAFAF due to lack of habitat (Dames & Moore 1997a).
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	SOC		Occurs in rugged mountainous country, associated with large bodies of water; may roost in buildings. Unlikely in vicinity of ISAFAF which is near the western limit of known range and does not provide suitable habitat (Dames & Moore 1997a).
Birds			
Western burrowing owl (<i>Athene cunicularia</i>)	SOC	P	A spring and fall migrant and breeder on the NTTR. Recorded on NTTR in Great Basin desert scrub and expected in slightly disturbed areas. Found just north of the runway at ISAFAF (Dames & Moore 1996a).
Gray flycatcher (<i>Empidonax wrightii</i>)	SOC		Widespread breeding resident of Great Basin, typically in middle to upper elevation montane habitats, not known or expected on ISAFAF (Dames & Moore 1997b).
Phainopepla (<i>Phainopepla nitens</i>)	SOC	P	Permanent resident of Mojave Desert scrub and desert spring habitats. Feeds on mistletoe berries, typically in mesquite thickets. Observed in vicinity of ISAFAF but not likely to occur in areas of project activity due to lack of habitat (Dames & Moore 1996a).
Lucy's warbler (<i>Vermivora luciae</i>)	SOC		Found in Mojave Desert riparian habitats. Possible in vicinity of ISAFAF but unlikely in project area due to lack of habitat (Dames & Moore 1997b).
Reptiles			
Banded Gila monster (<i>Heloderma suspectum cinctum</i>)		T	Mojave desert scrub habitats in extreme southernmost Nevada (Stebbins 1985). Unlikely in immediate project area due to marginal conditions for the species (near northern limit of range), disturbance, lack of habitat.
Chuckwalla (<i>Sauromalus obesus</i>)	SOC, BLM		Expected in rocky hillsides and rock outcrops in Mojave Desert scrub habitats in southern Nevada (Stebbins 1985). Unlikely in immediate project area due to disturbance and lack of habitat.
<p><i>Notes:</i> E Endangered T Threatened SOC Federal Species of Concern BLM Nevada BLM Sensitive Species List CE Listed as Critically Endangered by Nevada Department of Wildlife P Protected by the Nevada Division of Wildlife</p> <p><i>Sources:</i> Air Force 1981, 1994a, 1997g, 1997, 1997e; Burt and Grossenheider 1980; Hall 1946, 1981.</p>			

Indian Springs Air Force Auxiliary Field

The disturbance footprint of the proposed project at ISAFAF is confined to disturbed, mostly barren areas. As a result, with the exception of the desert tortoise and burrowing owl, no special status plant or animal species are known or likely to occur in the areas subject to ground disturbance at ISAFAF. Desert tortoises are known to occur on land surrounding ISAFAF, but were not detected in a survey of the airfield area (Dames & Moore 1996a), and their occurrence is unlikely given the level of disturbance and activity.

Burrowing owls have been known to occur in burrows in the disturbed soil at the north end of the runway at ISAFAF (Dames & Moore 1996a). Burrowing owls and other migratory birds are protected from unauthorized harm by the Migratory Bird Treaty Act and Executive Order 13186. For the sake of this analysis, burrowing owls are considered potentially present as either nesting or wintering individuals in the area subject to ground disturbance.

Nellis AFB Munitions Storage Area

At the Nellis MSA, no sign of desert tortoises or their burrows was noted on site, and insufficient quantity and quality of forage species as well as a lack of suitable substrate for burrowing due to the shallow depth and rocky nature of soils in the area were noted. Tortoises are known to occur, however, in the vicinity of the MSA (personal communication, J. Campe).

The state-listed Las Vegas bearpoppy occurs on Nellis AFB in the vicinity of the MSA (personal communication, J. Campe). However, this species was not found in the area of the proposed storage bunkers during a site inspection in April 2003. The site does not appear suitable for the species as it lacks the gypsum soils associated with this species.

3.8 CULTURAL RESOURCES

The ROI for cultural resources includes the sites and immediate vicinities where construction or ground disturbance would occur as a result of project-related actions. This includes numerous areas on ISAFAF and the area of the proposed new munitions storage structures at Nellis AFB.

3.8.1 Definition of the Resource

Cultural resources are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. They include archeological resources (both prehistoric and historic), historic architectural resources, and traditional resources. Only significant cultural resources (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action. Significant archeological and architectural resources are either eligible for listing, or listed on, the National Register of Historic Places (National Register). Significant traditional resources are identified by Native American tribes or other groups, and may also be eligible for the National Register. Traditional resources may include archeological sites, locations of historic events, sacred areas, sources of raw materials, topographic features, traditional hunting or gathering areas, and native plants or animals.

DoD's *American Indian and Alaska Native Policy* (1999) emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The Policy requires an assessment, through consultation, of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services.

3.8.2 Existing Conditions

Historic Setting

Prehistoric Background. The chronological history of the prehistoric human occupation in the region is typically divided into four periods: Lake Mojave Period (ca. 12,000 - 7,000 years ago), Pinto Period (ca. 7,000 – 4,000 years ago), Gypsum Period (ca. 4,000 – 1,500 years ago), and Saratoga Springs Period (ca. 1,500 years ago – European contact [about 450 years ago in this region]). The best evidence of initial human occupation dates to about 12,000 years ago, when the first inhabitants focused on hunting large Pleistocene mammals. Lake Mojave Period sites are typically found along the shorelines of ancient lakes although the exact role of the lakes in the overall adaptation of prehistoric peoples is still somewhat unclear. During the Pinto Period, the climate became both warmer and drier, and human behavior changed in step with the changing natural environment. Archeological sites contain increasing numbers of millingstones for plant exploitation, especially hard seeds, although hunting still played an important role. By about 5,000 years ago, the temperature began to decline and effective precipitation increased. Technological changes, including the use of mortars and pestles (possibly for mesquite exploitation), suggest that people reacted to the changing environment by making use of new foods. The technological innovations typical of the Gypsum Period appear to have supported larger population sizes and increased socioeconomic ties between groups. The Saratoga Springs Period marks a time of regional differentiation throughout the Mojave Desert and the introduction of the bow and arrow. There was also an apparent expansion of Numic-speaking groups throughout most of the Great Basin around 1,000 years ago.

Ethnographic Background. At the time of first European contact, the Indian Springs area was occupied by the Southern Paiute, a Numic-speaking group who probably arrived in the area about 1,000 years ago. The Las Vegas subgroup of the Southern Paiute inhabited a relatively large area extending into the Mojave Desert, and commonly employed a relatively mobile settlement system dependent on the seasonal availability of a wide variety of plants and animals. Early European contact with the Southern Paiute had very little direct impact until about the early nineteenth century, when Spanish impacts were both direct and devastating. Spanish colonies of northern New Mexico institutionalized slavery, and it appears that Southern Paiutes may have been held as slaves in Santa Fe and surrounding communities as early as the late 1700's (Dames & Moore 1996b). Slave trading ended after the Mormons arrived in Utah in 1847, but Mormon farms and settlements soon displaced Southern Paiutes from their best lands. Several reservations were later established, including the Moapa Reservation on the Muddy River in 1872, the Colorado River Reservation in 1874, the Shivwits Reservation in 1891, and the Las Vegas Colony in 1911 (Dames & Moore 1996b).

Historic Background. Indian Springs was originally known as "Indian Creek," where Charles Towner operated a ranch and rest stop since the 1870s. The arrival of the Las Vegas & Tonopah Railroad in 1906, which ended at Indian Springs, spurred interest in the area. The closure of the

tracks in 1918 had a direct affect on the community, with property changing hands between the homesteaders and larger entities like the Naquinta Cattle Company and the Nevada Hotel Mining Company (Dames & Moore 1996b). The next significant event in Indian Springs was the development of the Indian Springs Air Field in 1943, and its association with what would become Nellis AFB (originally the Army Air Corps Gunnery School and then the Las Vegas Air Force Base). The Indian Springs Air Field was closed in 1945, but was re-activated as the Indian Springs Air Force Base in 1950 and later renamed the ISAFAF (Dames & Moore 1996b; Page & Turnbull 1988). It has supported several range/test site missions including nuclear testing programs, combat training exercises, weapon system evaluations, and training for the Air Force Thunderbirds (USAF 2003). Predator assets were added to ISAFAF in 1995, when the Air Force activated the first Predator squadrons at ISAFAF (USAF 2003).

Identified Cultural Resources

ISAFAF

Archeological Resources. An intensive archeological survey of ISAFAF was conducted in 1995 in compliance with Section 110 of the National Historic Preservation Act (NHPA) (Dames & Moore 1996b). Thirteen archeological sites were recorded during the survey, including ten prehistoric sites and three historic sites. All of the sites, except two prehistoric sites (26CK3906 and 26CK5266), were determined not eligible for inclusion in the National Register. The remaining two sites were recommended as eligible for inclusion in the National Register based on their potential to yield information important to knowledge of the region's prehistory (Dames & Moore 1996b). The Nevada State Historic Preservation Office (SHPO) concurred with these site eligibility determinations in a letter dated 21 March 1996. The significance of 26CK3906 and 26CK5266 was later re-evaluated (Myhrer 1996), and the sites were determined not eligible for inclusion in the National Register. SHPO concurred with this revised significance determination in a letter dated 5 July 1996.

Historic Structures. An inventory and evaluation of World War II structures at ISAFAF was conducted in 1988 (Page & Turnbull 1988). The inventory recorded ten World War II era structures still standing at ISAFAF and determined that none of these properties appear to be eligible for the National Register either individually or as part of a district (Page & Turnbull 1988). SHPO concurred with this determination in a letter dated 14 June 1991. An inventory of Cold War era structures at ISAFAF was conducted in 1994 (Mariah and Associates 1994); no Cold War era significant structures were identified at ISAFAF.

Traditional Resources. Seventeen tribes have been identified, through ethnographic and historic research, to possess ancestral ties with the NTTR. The Indian descendants are within the Southern Paiute, Owens Valley Paiute, and Western Shoshone cultural traditions. The tribes are located in a 250-mile radius of Nellis AFB in Arizona, California, Nevada, and Utah. Beginning in 1996, Nellis AFB and Indians with ancestral ties to NTTR created a Native American Interaction Program (NAIP) with year-round active field and meeting participation by 16 tribal chairs and 32 designated representatives. NAIP offers Native American participation in field trips to ancestral sites, archeological research, and ethnographic studies. An NAIP Document Review Committee was formed in 1999 to review Nellis AFB environmental reports and to provide comments.

While all parts of the land and resources are valuable to Native American people, they have assisted Nellis AFB in designating the most sensitive areas in which to invest scarce protection funds and additional research. In a 15-mile radius surrounding ISAFAF, the Spotted Range and Pintwater Cave possess significant ceremonial sites based on Native American field research and document reviews; these sites are monitored for protection.

Although no Native Americans participated in the archeological survey of ISAFAF (which occurred before the implementation of NAIP), Native Americans have been involved with several compliance archeological inventories within 5 miles of ISAFAF. In addition, a large percentage of ISAFAF was disturbed at the time of the survey. In similar instances, when previously disturbed land was evaluated for cultural resource sensitivity, participants in NAIP agreed with the Nellis AFB archeologists that this type of impacted land has low potential for locating archeological sites with integrity. Thus, while the program was not created until after the ISAFAF inventory, the similarity of environment and previous land disturbance suggests that NAIP participants would likely have concurred with the final determination of no historic properties at ISAFAF.

Nellis AFB

Efforts to identify and evaluate cultural resource properties within Area II of Nellis AFB, which houses the base Munitions Storage Area and is the proposed location of the new munitions storage structures, are described in cultural resources reports *Archaeology of Areas II and III, Nellis AFB* (Environmental Solutions, Inc 1995), *A Class III Inventory in Areas II and III* (Rowe 2000), and *Reevaluation of Archaeological Sites on Nellis AFB* (Rowe and Myhrer 2001). SHPO consultation was completed with letters dated 15 March 1995, 3 January 2001, and 12 April 2001. Site 26Ck4984, a prehistoric quarry site, located on the south side of the perimeter fence in Area II and outside the proposed project area, is the only eligible property in Area II.



Surveys for archaeological, historic, and traditional resources were conducted on ISAFAF during the 1990s. No sites have been identified as eligible for listing in the National Register.

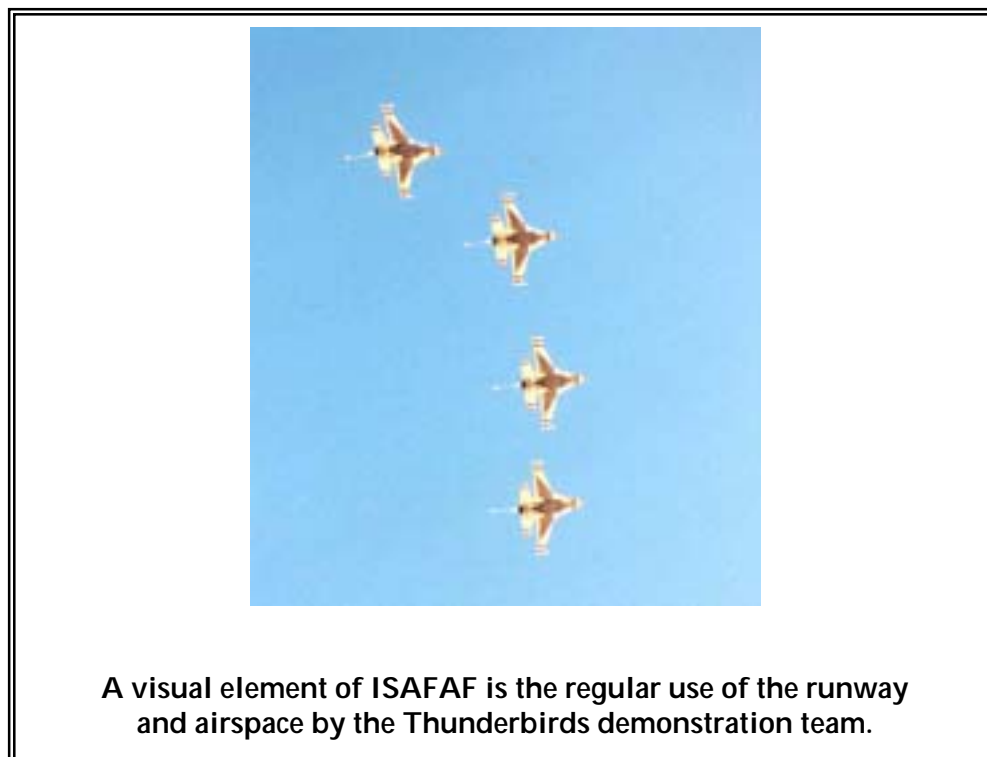
3.9 VISUAL RESOURCES

The ROI for visual resources includes ISAFAF and the neighboring town of Indian Springs and the surrounding countryside.

3.9.1 Definition of the Resource

The viewscape is defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impression that an observer receives of an area or its landscape character. Topography, landforms, water surfaces, vegetation, man-made features, and the degree of panoramic view available are considered characteristics of an area if they are inherent to the structure and function of the landscape.

Landscape character is studied to determine whether changes in visual character could occur and whether such potential changes are compatible with an affected setting or would noticeably contrast with it. The significance of a change in visual character is influenced by social considerations, including public value placed on the resource, public awareness of the area, and general community concern for the viewscape associated with an area.



3.9.2 Existing Conditions

The surrounding landscape is typical of the Mojave Desert, with low-lying enclosed basins surrounded by low mountains, and bajadas formed of coalescing alluvial fans. ISAFAF is located in the southern part of the Great Basin, which is characterized by steep, north-trending mountain ranges that are separated by vast alluvial basins. Elevations in the vicinity range from approximately 3,000 feet in the Indian Springs Valley to over 6,000 feet in the Pintwater

and Spotted Ranges to the north. The topography can be described as high, thin mountain ranges with alluvial basins in between. The ranges are comprised of block-faulted mountains that rise abruptly from flanking bajadas (coalescing alluvial fans). On the bajadas and mountain slopes, the vegetation is typically dominated by creosote bush and white bur-sage.

The air is generally clear allowing grand distant vistas of endless desert, imposing mountain ranges, and blue skies. The viewscape is what attracts many people to the desert, and the views in the desert surrounding ISAF AF do not disappoint. Within the base and the town, however, the views of the immediate vicinity are different. Manmade alterations and intrusions abound and generally replace the naturalness and wildness of the undisturbed desert.

ISAF AF is adjacent to U.S. 95, and essentially the entire base is visible to the traveling public. Buildings, fences, parked vehicles, water towers and all manner of built environment is unavoidably visible. To the highway traveler, however, the brief visual intrusion of the relatively small base and the even smaller town is a minor diversion that passes in a minute or so before the viewer returns to relatively undisturbed desert vistas.

3.10 LAND USE

The ROI for land use includes the area within and adjacent to ISAF AF and the Nellis AFB MSA.

3.10.1 Definition of the Resource

The attributes of land use addressed in this analysis focus on general land use patterns, management plans, policies, and regulations. These provisions determine the types of uses that are allowable and identify appropriate design and development standards to address specially designated or environmentally sensitive areas.

3.10.2 Existing Conditions

Indian Springs Air Force Auxiliary Field

ISAF AF is located approximately 45 miles northwest of Las Vegas, Nevada on Highway 95, within the overall boundaries of the Nevada Test and Training Range (NTTR), as depicted on Figure 1-1. Land uses within NTTR are designated for military activities. ISAF AF is within the South Range of NTTR. South Range lands were withdrawn for exclusive military use pursuant to the enactment of the Military Land Withdrawal Act (MLWA) of 1999, PL 106-65.

Most of the federal lands outside of NTTR are under the jurisdiction of BLM. BLM's guiding principle of multiple use extends to the use of federal lands withdrawn for national defense and security, which although not available for public use, remain under BLM's management with the exception of Desert National Wildlife Range (DNWR) lands withdrawn to the USFWS. Policies and programs implemented on withdrawn lands must meet federal requirements mandated and administered through BLM.

The DNWR was established for the preservation of desert bighorn sheep in its natural environment. Lands within the DNWR encompass approximately 1,588,00 acres, including lands north of Highway 95. The DNWR is under the sole administration of the USFWS. Joint-

use of the DNWR and NTTR began during World War II when portions of the area near Indian Springs were identified as suitable military training grounds. Use and public access to the joint-use area of DNWR and NTTR is restricted by an MOU between the Air Force and the DOI (for USFWS) and further, by PL 106-65, as amended. The MOU delineates the rights and responsibilities of the two agencies with regard to the overlapping withdrawals.

ISAFAF encompasses approximately 2,830 acres of land. The majority of land at ISAFAF (approximately 81 percent) is designated as open space in order to ensure Clear Zone safety around the airfield. The main ISAFAF airfield, Instrument Runway 08/26, runs east-west across the base. Runway 13/31 runs northwest-southeast across the base and supports RQ-1 Predator UAV operations. A third runway (04/22), which runs southwest-northeast, is inactive.

ISAFAF is the practice base for the Nellis-based Thunderbirds demonstration team and currently supports the beddown of two functional RQ-1 Predator Unmanned Aerial Vehicle (UAV) squadrons. The 11th and 15th Reconnaissance Squadrons (RS), which are part of the 57th Wing (57 WG) and the 99 SFG Ground Combat Training Squadron (99 GCTS) are based at ISAFAF. In addition, the 17 RS is based at ISAFAF, but it has no assigned aircraft.

ISAFAF provides support and maintenance for the NTTR, including 57 WG flying operations, Expeditionary Readiness Training (ExpeRT), and Security Forces Training. ISAFAF is also the primary emergency divert base during NTTR exercises.

Aircraft operations and maintenance facilities are located south of Runway 08/26 in the developed area of the base. Ancillary infrastructure, including a wastewater treatment facility and storage structures are located north of the runway. Several industrial land uses, including supply, vehicle maintenance, and transportation facilities are situated in the main base area, south of the airfield. The base exchange, dining hall, and temporary lodging facilities are also located in the main base area. Table 3.10-1 summarizes the existing land uses at ISAFAF.

Table 3.10-1. Existing Land Uses at Indian Springs AFAF

<i>Land Use Category</i>	<i>Present Acreage</i>	<i>Percent of Total</i>
Airfield	227.24	9.55
Aircraft Operations and Maintenance	18.71	0.79
Industrial	193.11	8.12
Administrative	2.63	0.11
Community (Commercial)	0.39	0.02
Community (Service)	3.30	0.14
Medical	0.62	0.03
Temporary Lodging	5.81	0.24
Recreation	8.5	0.36
Open Space	1,918.89	80.65
TOTAL	2,379.20	100
Source: USAF 2003.		

A Functional Relationships Analysis was conducted for ISAFAF. The purpose of this analysis is to determine the spatial relationships that should exist between the various land uses found on base, and to identify incompatible land uses that should be separated. The analysis concluded

that most of the land uses at ISAFAF are appropriately located. For example, the main ISAFAF airfield is located in close proximity to aircraft operations and maintenance facilities and open space. However, some incompatibilities exist concerning the proximity of temporary lodging and medical land uses to the airfield and to adjacent industrial facilities (USAF 2003).

The unincorporated community of Indian Springs is located in northeastern Clark County, Nevada on Highway 95, adjacent to ISAFAF (see Figure 1-1). The community of Indian Springs encompasses approximately 600 acres and is bordered by ISAFAF to the north and by lands managed by the BLM to the east, south, and west. The town has a population of approximately 1,400. Residents express appreciation for rural location and the separation from the large city that Indian Springs provides. The community has a public library, a community center, a fire station, and educational facilities that provide for the needs of the local community.

Nellis AFB Munitions Storage Area

Approximately 1,784 acres at Nellis AFB (about 13 percent of the base) is designated for industrial uses in three land use areas: Area I, Area II, and Area III. The Nellis Munitions Storage Area (MSA) is located in Area II in the southeast portion of the base. The current storage capacity of the Nellis MSA has been identified as inadequate (USAF 2003).

3.10.3 Land Management Plans

Adopted plans and programs guide land use planning on ISAFAF and Nellis AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development.

The ISAFAF General Plan and the Nellis AFB General Plan provide overall perspectives concerning development and provide frameworks for making effective programming, design, and resource management decisions.

The DoD developed the Air Installation Compatible Use Zone (AICUZ) program in order to achieve compatible land use around military airfields. The purpose of the AICUZ is to balance the needs of aircraft operations and community concerns, while preventing incompatible development. The AICUZ guidelines define zones of high noise and accident potential and recommend uses that are compatible within these zones. The Air Force is currently in the process of drafting an AICUZ plan for ISAFAF. Currently, AICUZ considerations (noise and airfield clearances) do not restrict ISAFAF development (USAF 2003).

3.11 SOCIOECONOMICS

The ROI for socioeconomics is Clark County, Nevada.

3.11.1 Definition of the Resource

For purposes of this EA, socioeconomics includes employment, population, housing, and public schools.

3.11.2 Employment

The largest employers in the vicinity of Indian Springs include ISAFAP, the Southern Desert Correctional Center and Indian Springs Conservation Camp and Boot Camp, and the federal Department of Energy Nevada Test site facility. ISAFAP has 1,157 assigned personnel. The Southern Desert Correctional Center and Indian Springs Conservation Camp and Boot Camp is a combined facility located just east of the community of Indian Springs and ISAFAP. The high security Southern Desert Correctional Center houses 1,354 inmates and has a staff of 246. The minimum security Indian Springs Conservation Camp and Boot Camp house 228 inmates: 168 in the conservation camp and 60 in the boot camp and has a staff of 23. The Department of Energy Nevada Test Site (NTS) located in neighboring Nye County and other NTS-related activities (in Las Vegas) employed about 3,390 persons as of 1999, the large majority (88 percent) of whom were contractor employees. Employment at the NTS increased during the 1970s and 1980s, peaking at 11,500 employees in 1987. With the end of the Cold War and cessation of nuclear weapons testing in 1992, employment declined from 9,300 in 1992 to its current level. Between 1992 and 1998, NTS employment dropped by 3,030 (70 percent) in Nye County and by 1,220 (41 percent) in Las Vegas.

The community of Indian Springs has few employment opportunities within the settlement with the exception of the combined elementary/middle/high school, the county branch library, and highway services. Nearly all residents of the community work elsewhere with an average commute time of 38 minutes. Approximately 12 percent of the working residents of the community are employed outside Clark County, primarily in neighboring Nye County.

Full- and part-time employment in the State of Nevada increased by almost 776,000 jobs (at an average annual rate of 4.9 percent) between 1980 and 2000. Employment levels rose from almost 490,000 in 1980 to just under 767,000 in 1990 and almost 1,265,000 in 2000. The rate of growth in the 1990s was faster (5.1 percent annually) than in the 1980s (4.6 percent annually).

The 10 largest employers in Clark County as of 2001 were: (1) Clark County School District (about 25,500 employees); (2) Bellagio Hotel and Casino (about 8,600 employees); (3) Clark County (about 8,200 employees); (4) MGM Grand Hotel (about 8,100 employees); (5) Bally's and Paris Casino Hotels (about 7,700 employees); (6) Mirage Hotel and Casino (about 6,500 employees); (7) Mandalay Bay Resort and Casino (about 5,600 employees); (8) Caesar's Palace Hotel and Casino (about 5,000 employees); (9) State of Nevada (about 4,800 employees); and (10) Venetian Casino Resorts (about 4,400 employees).

The number of jobs in Clark County increased by just over 593,000 between 1980 and 2000 at an average annual rate of over 6 percent. As with the state, growth was more rapid in the 1990s (with an average annual rate of growth of 6.5 percent) than in the 1980s (with an average annual rate of growth of 5.6 percent). Clark County's share of total statewide employment increased steadily from 54.3 percent in 1980 to 59.9 percent in 1990 to 67.9 percent in 2000. Clark County contributed over three-quarters (76.4 percent) of these new jobs created in the state over the 20-year period.

In 2000, the largest contribution to non-farm employment (44.3 percent) in Clark County was attributable to the services sector of the economy. This contribution has remained virtually constant over the period 1980-2000. Industrial sectors that have increased their share of non-

farm employment over this period include: agricultural services, forestry, and fishing; construction, and finance, insurance, and real estate although their absolute numbers are relatively small. The most noticeable reductions have taken place in the public sectors of the economy: federal civilian; federal military; and state government. The military contribution fell from 4.0 percent in 1980 to 1.1 percent in 2000. As of 2001, the number of active duty personnel assigned to Nellis AFB stood at just over 6,800 with an additional 2,800 civilian employees working on the installation.

3.11.3 Population

Over the period 1990-2001 the population of the State of Nevada increased by over 896,000 persons at an average annual rate of 5.1 percent. A large portion (almost 80 percent) of that growth took place in Clark County where the resident population increased from about 770,000 in 1990 to almost 1,486,000 in 2001. All municipalities within Clark County (with the exception of Boulder City) experienced robust growth rates over the period: 10.0 percent average annual rate for Henderson; 5.9 percent for Las Vegas, 17.9 percent for Mesquite; and 8.9 percent for North Las Vegas. Boulder City, which passed a growth control ordinance in 1979 that limited population expansion to 120 new housing units a year, experienced a rate of 1.3 percent annually. Since 1996, population estimates have been developed for unincorporated communities. This information reveals that some of these communities have added sizeable numbers of residents and experienced rapid growth. Over the period 1996-2001, the community of Enterprise grew from about 10,400 to just over 34,000 residents at an average annual rate of 27 percent. The community of Sunrise Manor added 41,500 residents over this period at an average annual rate of 5.7 percent.

Between 1996 and 2001, the population of the community of Indian Springs grew from 1,135 to 1,471, an increase of 336 residents and average growth rate of 5.3 percent annually.

3.11.4 Housing

Housing resources both on-base and off-base are addressed below.

Off-Base Housing

Clark County contained almost 560,000 housing units in the year 2000 (U.S. Bureau of the Census). The number of units increased by over 76 percent over the period 1990-2000. The most rapid increase in the number of housing units (over 97 percent) occurred in the municipalities of the county while growth in the unincorporated portions of the county took place at a slower pace (56 percent).

The greatest numbers of units over the period 1990-2000 were added in the municipalities of Las Vegas (81,027 units), Henderson (45,749 units), and North Las Vegas (20,763 units) although sizeable numbers of housing units were added in unincorporated communities such as Spring Valley (30,634 units), Paradise (21,474 units), and Sunrise Manor (21,146 units). Over this time period, the following communities more than doubled their housing stock: Henderson; North Las Vegas; and Spring Valley.

As of 2000, the community of Indian Springs contained 638 housing units of which the large proportion (81 percent) were comprised of mobile homes. Rental units comprised 43.3 percent of occupied housing units. Almost 75 percent of the householders in the community had resided in their residence for five years or less.

Over the period 1990-1999, an average of over 24,200 housing units were authorized for construction in Clark County. Of this total, about 64 percent were built in the municipalities of the county and 36 percent were constructed in unincorporated sections of the county. The share of total countywide residential construction taking place in the unincorporated portions of the county increased over the period 1990-1999 from a low of 26 percent in 1992 to almost 41 percent in 1998. The contribution to the total growth made by Henderson increased from a low of 15 percent in 1994 to almost 22 percent in 1999. The contribution by North Las Vegas to the growth in housing increased from almost 4 percent in 1990 to almost 10 percent in 1999. Las Vegas saw its contribution fall from over 44 percent in 1990 to about 27 percent in 1999.

Of the residential units that have been authorized for construction over the period 1990-1999 in Clark County (just over 242,000), almost 68 percent were for single unit buildings, less than 1 percent for two-unit buildings, just under 2 percent for three- and four-unit buildings, and almost 30 percent for five- or more unit buildings.

On-Base Housing

Housing designed and built to accommodate military personnel exists at both Nellis AFB and ISAFAP. Nellis AFB contains housing for personnel both accompanied by dependents (known as Accompanied or military family housing) and without (unaccompanied housing). ISAFAP is the site of temporary housing for unaccompanied personnel only.

Accompanied Housing

Almost 1,300 housing units on Nellis AFB are designated for accompanied military personnel assigned to the base. The largest number (679 units), contained in Nellis Terrace on the western edge of the main base, is assigned to enlisted personnel. Originally built in the 1950s, demolition and construction programs between 1996 and 2001 resulted in 340 new units. The Manch Manor complex contains 593 units located about 1 mile from the main base. Of these units, 580 (built in the 1960s and 1970s) are assigned to enlisted personnel and 13 units (built in 1983) are assigned to senior officer grade personnel. Dunning Circle, located near Nellis Terrace on the main base, consists of six units assigned to general officer/senior officer grade personnel.

No family housing units are located on ISAFAP.

Unaccompanied Housing

Nellis AFB has 16 dormitories with a capacity to accommodate 1,210 unaccompanied enlisted personnel. The dormitories are located adjacent to community services and dining facilities.

Other Housing

Other housing assets at Nellis AFB include: six visiting officer quarters (VOQ) containing 368 units; two visiting airman's quarters (VAQ) with 343 units; and nine temporary lodging facilities (TLF) with 60 units.

At ISAFAP, seven buildings accommodate unaccompanied personnel, including: two VOQ buildings that accommodate 28 persons; and five VAQs that accommodate 162 persons.

Approximately 64 percent of active duty personnel and their family members assigned to Nellis AFB reside off the base in surrounding communities.

3.11.5 Public Schools

Clark County School District provides public school services and facilities through Clark County and had an enrollment of 244,684 students in school year 2001-2002. This level of enrollment represents an increase of 13,559 students (5.9 percent) over the previous year. The district employs a total of 27,158 persons including full- and part-time, substitute, and temporary employees. Of this total, 14,067 (52 percent) were licensed full- and part-time teachers and an additional 2,300 were substitute teachers. The 2001-2002 budget of \$1.19 million showed an increase of almost 9 percent over the preceding year. Funding sources available to the district were: (i) local sales tax (41.3 percent); (ii) property tax (23.0 percent); (iii) state support (27.9 percent); and federal aid and other sources (7.8 percent). Approximate per-pupil expenditures were \$4,921 in school year 2001-2002, up from \$4,774 (a 3.1 percent increase) in 2000-2001.

The public school located in the community of Indian Springs accommodates grades K through 12. Compared to most schools in the district, the Indian Springs Elementary/Middle/High school is small with an enrollment of only 315 students. Its counselor-to-student ratio (1:315), transiency rate (18 percent), student attendance rate (94.1 percent), and computer-to-student ratio (1:3) , however, are all above those for the district as a whole which has values of 1:582, 36 percent, 93.9 percent, and 1:7, respectively. It is, however, one of only a handful of schools to have experienced a decline in enrollment (12 percent reduction) as compared to a district-wide increase in enrollment of almost 5.9 percent.

3.12 ENVIRONMENTAL JUSTICE

The ROI for environmental justice is generally referred to as the region of comparison (ROC). The ROC is the area in which the principal effects arising from implementation of the proposed action are likely to occur. As it applies to ISAFAP, the ROC is Clark County, Nevada. The ROC is used to determine whether significant environmental effects have the potential to adversely impact minority populations and/or low-income populations to a degree that exceeds, or would be likely to exceed, potential impacts on the general public.

3.12.1 Definition of the Resource

Since the 1970s, public awareness and concern has increased about evidence that low-income and minority communities often suffer disproportionately from exposure to unhealthy

environmental conditions. Excessive exposure to lead, hazardous materials in the workplace, noise and air pollution, and the frequent location of industry and infrastructure developments in these communities are key concerns for the environmental justice movement. In response, President Clinton issued a special Executive Order (12898) in 1994 to raise awareness and bring environmental justice issues into public policy debate.

The EPA (1998) offers the following definition of environmental justice:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The President's Executive Order requires that "to the greatest extent practicable ... each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."

Application of this Executive Order to projects subject to NEPA, such as the proposed project at ISAFAP, suggests that two questions be examined: (1) is a federal project with significant adverse environmental impacts being proposed in a community comprised largely of minority or low-income persons and (2) would any significant adverse human health or environmental effects of the project disproportionately affect minority or low-income persons?

3.12.2 Minority Populations and Low-Income Populations

For purposes of this analysis, minority populations and low-income populations are defined as:

- *Minority Populations* - An individual or group of individuals that are Hispanic, Asian American and Pacific Islander, African-American, American Indian or Alaskan Native.
- *Low-Income Populations* - Persons living below the poverty level, based on \$17, 050 for a family of four as reported in the 2000 census.

The proposed action would increase military facilities and training activities at ISAFAP in order to support the proposed beddown of Predator assets. The population potentially affected by the proposed action is the community of Indian Springs, located directly south of ISAFAP. The community of Indian Springs is located in Clark County, Nevada, and is the focus of this environmental justice analysis.

Data characterizing the current demographic and economic profiles of the project area were obtained from the 2000 Census (U.S. Bureau of the Census 2000). The data show that the community of Indian Springs has a lower percentage of minorities (14 percent) as compared to

the percentage of minorities in Clark County (40 percent) and the state of Nevada (35 percent). The data are presented in Table 3.12-1.

Approximately 10.7 percent of the population of Indian Springs lives below the poverty level (refer to Table 3.12-1). This percentage is proportionate to the percent of individuals living below the poverty line in Clark County (10.8) and in the state of Nevada (10.5).

Table 3.12-1. Minority and Low-Income Population in 2000

<i>Category</i>	STATE		CLARK COUNTY		INDIAN SPRINGS CDP	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Total Population	1,998,257	100.0	1,375,765	100.0	1,302	100.0
Total Minority Population	695,256	35.0	547,096	40.0	181	14.0
Hispanic or Latino (all races)	393,970	19.7	302,143	22.0	89	6.8
Not Hispanic or Latino	1,604,287	80.3	1,073,622	78.0	1,213	93.2
One Race	1,555,056	77.8	1,036,940	75.4	1,188	91.2
Black or African American	131,509	6.6	121,401	8.8	15	1.2
American Indian and Alaska Native	21,397	1.1	7,761	0.6	25	1.9
Asian	88,593	4.4	71,226	5.2	15	1.2
Native Hawaiian and Other Pacific Islander	7,769	0.4	5,864	0.4	11	0.8
Some other race	2,787	0.1	2,019	0.1	1	0.1
Two or more races	49,231	2.5	36,682	2.7	25	1.9
Total Individuals Below Poverty Level	205,685	10.5	145,855	10.8	140	10.7
<i>Source:</i> U.S. Bureau of the Census 2000						

3.13 INFRASTRUCTURE

The ROI for infrastructure includes ISAFAF and northwest Clark County.

3.13.1 Definition of the Resource

The infrastructure elements addressed in this section include public services (fire protection and police protection) and utility systems (water supply, wastewater collection and treatment, stormwater drainage, electricity, and communications).

3.13.2 Fire Protection

ISAFAF maintains one fire station, located in Building 85, with a staff of 33 firefighters. The base has 30 fire hydrants and approximately 200 feet of fire protection water pipelines. The fire protection system is comprised of alarm detection systems; sprinkler systems, including an aqueous film-forming foam closed head sprinkler system; hood suppression systems; and alarm communication systems. The Fire Department also has aircraft crash apparatus.

The ISAFAF fire suppression system was recently rated as degraded in the 2001 HQ ACC Infrastructure Assessment (USAF 2001c). This evaluation noted deficiencies based on the Life Safety Code for Visiting Officer and Airman quarters and other base facilities, including an aircraft hangar without fire suppression systems.

3.13.3 Police Protection

Law enforcement services in Clark County are provided by the Las Vegas Metropolitan Police Department. Nevada Highway Patrol is responsible for traffic enforcement and accident investigation on Highway 95. Police protection at ISAFAF is provided by civilian security personnel assigned to the NTTR and stationed at ISAFAF (USAF 1999).

3.13.4 Water Supply

The ISAFAF water system includes three wells, a liquid chlorine treatment system, a 150,000-gallon water tank, and an old 50,000 non-operational tank. Wells 62-1, 106-2, and ISAFAF Well 3 provide potable water to the base. The system presently treats approximately 88,000 gallons per day (gpd). Daily usage is approximately 95 gpd per person based on information in the ISAFAF General Plan (USAF 2003).

The existing polyvinyl chloride (PVC) piping and 150,000-gallon storage reservoir are considered adequate to meet the current water demands at ISAFAF (USAF 2001c).

3.13.5 Wastewater Collection and Treatment

ISAFAF owns and operates a wastewater treatment plant. Effluent from flows through a gravity collection system and is treated at an activated sludge treatment plant, before it is discharged into State of Nevada groundwater sources. Treated effluent is held in percolation basins that are used to recharge groundwater supplies. The plant has a design capacity of 90,000 gpd. The plant presently operates at approximately 22 percent of capacity, treating 20,000 gpd, with peak flows of approximately 30,000 gpd (USAF 2003).

ISAFAF maintains a wastewater collection system that collects and transfers wastewater to the influent pumping station. Recent upgrades to the influent pump station include the addition of valves, a valve volt, and a SCADA alarm system (USACE 2003).

ISAFAF has a looped recovery system for industrial wastewater. Currently, industrial wastewater is not discharged into the wastewater collection system.

3.13.6 Stormwater Drainage

ISAFAF operates and maintains an onsite storm drainage system. Currently, the system is considered inadequate to handle large amounts of water during occasional severe storms (USAF 2001c).

3.13.7 Electricity

Electrical power is provided to ISAFAF by the Nevada Power Company. The electrical distribution system at ISAFAF consists of a 2,400/4190 volt feeder. Power is provided to the

feeder through a single 13.8/41.6 kilovolt (kV), 5 megavolt-ampere (MVA) transformer to one of three circuit breakers located in a Nevada Power substation (USAF 2003). The existing electrical substation is equipped with a voltage regulator and provides three circuits for base power distribution. A loop feed is utilized for a large part of the Indian Springs circuit. In addition, ISAFAF operates six standby power units and three Equipment Authorization Inventory Data (EAID) systems for emergency operations. ISAFAF does not have a central Energy management System (EMCS), however selected buildings are equipped with control systems (USACE 2003).

Currently, the ISAFAF electrical distribution system is considered degraded, due to the system's age and condition. Overhead electrical circuits located near the flight line violate airfield clearance criteria due to the height and proximity of the lines. The situation is not a safety issue, however, and an Airfield Waiver (LKTC019W) has been obtained for the clearance violation. Additionally, the ISAFAF standby power systems are considered unsatisfactory and are not in compliance with ACC standards (USAF 2001c).

3.13.8 Communications

ISAFAF communication systems consist of standard telecommunication installations. ISAFAF communication systems include telephone systems, satellite connections, radio systems, and communication rooms. The existing CAT-5 cable has a 290-foot limitation (USACE 2003).

3.14 TRANSPORTATION

The ROI for transportation includes the U.S. Highway 95 (U.S. 95) corridor from Las Vegas to the north Clark County line.

3.14.1 Definition of the Resource

Transportation and circulation refer to the movement of vehicles throughout a road and highway network. Primary roads, such as major highways, are principal arterials designed to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads feed arterials that collect traffic from common areas and transfer it to primary roads.

3.14.2 Existing Conditions

Due to its remote location, the roadway network surrounding ISAFAF is minimal. Access consists primarily of U.S. 95, which is the only highway to Las Vegas and to points north (see Figure 1-2). Highway 95 traffic dropped substantially with the reduction in NTS employment between 1992 and 1998 (see section 3.11.2). A few local roads exist to serve the community of Indian Springs, south of the ISAFAF Main Gate. The remaining roadways in the region provide limited access to homes, ranches, and federal lands.

The ISAFAF roadway network includes streets, parking areas, and miscellaneous pavements. The January 2001 Infrastructure Program Review of Roadway Pavement Systems at ISAFAF reports that the overall engineering condition assessment rating of the pavement system is "adequate". A prioritized project list was developed as a result of the above report, and includes projects to repair Perimeter Road and various parking lots on base. (USAF 2003)

The Main Gate has two inbound and two outbound lanes, but is assumed to function as a single lane because of access control. The intersection is signalized and offset to the west from McFarland Ave, the main accesses arterial to Indian Springs. As such, the intersection functions very much like a signalized T and supports right and left turn lanes from U.S. 95. The Main Gate also provides access to the West Frontage Road. Current peak traffic volumes at the Main Gate are 337 vehicles per hour, which is consistent with the current employment of 925 persons.

The East Gate has one inbound and one outbound lane and is assumed to function as a single lane. The East Gate accesses U.S. 95 at a point where the highway is divided, although there is a break in the median at that point. It is configured for single access and egress lanes and is not signalized. Current peak volumes at the East Gate are unknown, but assumed to be less than 100 vehicles per hour due to the limited use of this access point. Historically, the East Gate has been used only for construction traffic and during times of threat when the Main Gate is closed for security reasons.

Most employees arrive at ISAF AF by shuttle, increasing average vehicle occupancy and reducing peak hour traffic volumes well below the levels that would normally be associated with a more typical vehicle occupancy of one person per vehicle.



Highway 95 is a lightly traveled four-lane divided highway that connects ISAF AF to the Las Vegas area.

3.15 HAZARDOUS MATERIALS AND WASTE

The ROI for hazardous materials use and hazardous waste generation includes the proposed facility sites at ISAF AF and Nellis AFB and their immediate vicinities where construction and operations activities would occur as a result of project-related actions.

3.15.1 Definition of the Resource

This discussion of hazardous materials and waste includes the sites and facilities at ISAF AF where hazardous materials are used, stored, or disposed. Potential hazardous waste contamination areas that are under investigation as part of the Air Force Environmental Restoration Program (ERP) are also discussed.

3.15.2 Existing Conditions

Hazardous Materials/Waste Management

Activities at ISAFAF require the use and storage of a variety of hazardous materials associated with general aviation and vehicle maintenance activities. These include, but are not limited to, batteries, anti-freeze, paint, aerosol cans, and solvents (USAF 2003).

The 98th Range Wing has a contractor who manages the 90-day Central Accumulation Site (CAS) at ISAFAF. This site accepts all types of hazardous wastes from all ISAFAF users. These units include Air Force personnel, temporary duty units, tenant organizations, associate contractors, and subcontractors who generate hazardous wastes. These organizations operate Initial Accumulation Points (IAP) to accumulate up to 55 gallons of hazardous wastes or 1 quart of acutely hazardous waste prior to transfer to the CAS. Both the IAPs and CASs are subject to regular inspections, which could include operation and facility surveys, waste stream analyses (if required), personnel review for training requirements, and documentation requirements. The Defense Reutilization and Marketing Office (DRMO) contracts for the picking up the hazardous waste and shipment for disposal of the wastes generated on ISAFAF.

Environmental Restoration Program Sites

For approximately 60 years, ISAFAF has been used as a support area for activities at Nellis Air Force Range (now Nevada Test and Training Range). Activities included in the past, and still include, maintenance of helicopters and vehicles, facility upkeep, fuel/oil storage, as well as storage and maintenance of the Predator UAV. As a result of these activities, several areas on ISAFAF have become contaminated with hazardous or toxic compounds (petroleum products, radioactive material, cleaning and wash materials, paint products, and antifreeze) (USAF 2001b).

Nellis AFB environmental staff has implemented the Air Force ERP to identify and investigate potentially hazardous material disposal sites. The ERP process begins with a Preliminary Assessment (PA) designed to identify and evaluate past disposal and/or spill sites that might pose a potential or actual hazard to public health, welfare, or the environment. The ERP is a vehicle allowing Air Force environmental staff to work with the Nevada Department of Environmental Protection (NDEP) to investigate and remediate environmental impacts in accordance with USAF policy and consistent with the process required by the *Comprehensive Environmental Response, Compensation, and Liability Act National Contingency Plan* (CERCLA NCP), as well as Resource Conservation and Recovery Act (RCRA) and other laws.

The 13 ERP sites present on ISAFAF are listed in Table 3.15-1 (USAF 2001b). Of these sites, 11 are identified as “No Further Action Required” and two have “Long Term Monitoring” Requirements. The locations of the ISAFAF ERP sites are shown on Figure 3.15-1.

ISAFAF is not listed on the Environmental Protection Agency (EPA) National Priority List (NPL), also known as Superfund sites, which is used to determine which sites warrant further investigation and/or abatement or clean-up orders.

Table 3.15-1. Environmental Restoration Program Sites at ISAF AF

<i>Site ID (Previous ID)</i>	<i>Description</i>	<i>Materials Disposed</i>	<i>Dates of Operation</i>	<i>Status*</i>
LF-01 (LF-41)	Landfill	General refuse	Early 1950's-1975	LTM
LF-02 (LF-42)	Landfill	Vehicle parts, targets	Unknown	LTM
DP-03	Burial Pits	General refuse	1940's-1950's	NFA
SD-04 (SD-44)	Sewage treatment	Sewage, sludge, effluent	1950's-present	NFA
FT-05 (FT-45)	Fire training area	Fuel	1959-present	NFA
SD-06 (SD-46)	Washdown areas	Radioactive dust	Early 1950's	NFA
SS-07 (SS-47)	Oil spreading site	Oil, POL	Late 1970's	NFA
OT-08 (OT-48)	Munitions burial	Munitions	Unknown	NFA
OT-09 (OT-49)	Munitions burial	Munitions	Unknown	NFA
LF-10 (LF-34)	Landfill	Munitions, general refuse	Late 1950's-1970's	NFA
OT-11	Landfill	Munitions	1950's-1960's	NFA
OT-12 (OT-55)	Munitions burial	Munitions	Unknown	NFA
SD-13 (SD-56)	Drainage ditch	Oil, fire retardant	Unknown	NFA
*LTM: Long Term Monitoring NFA: No Further Action Recommended <i>Source:</i> Adapted from USAF 2001a				

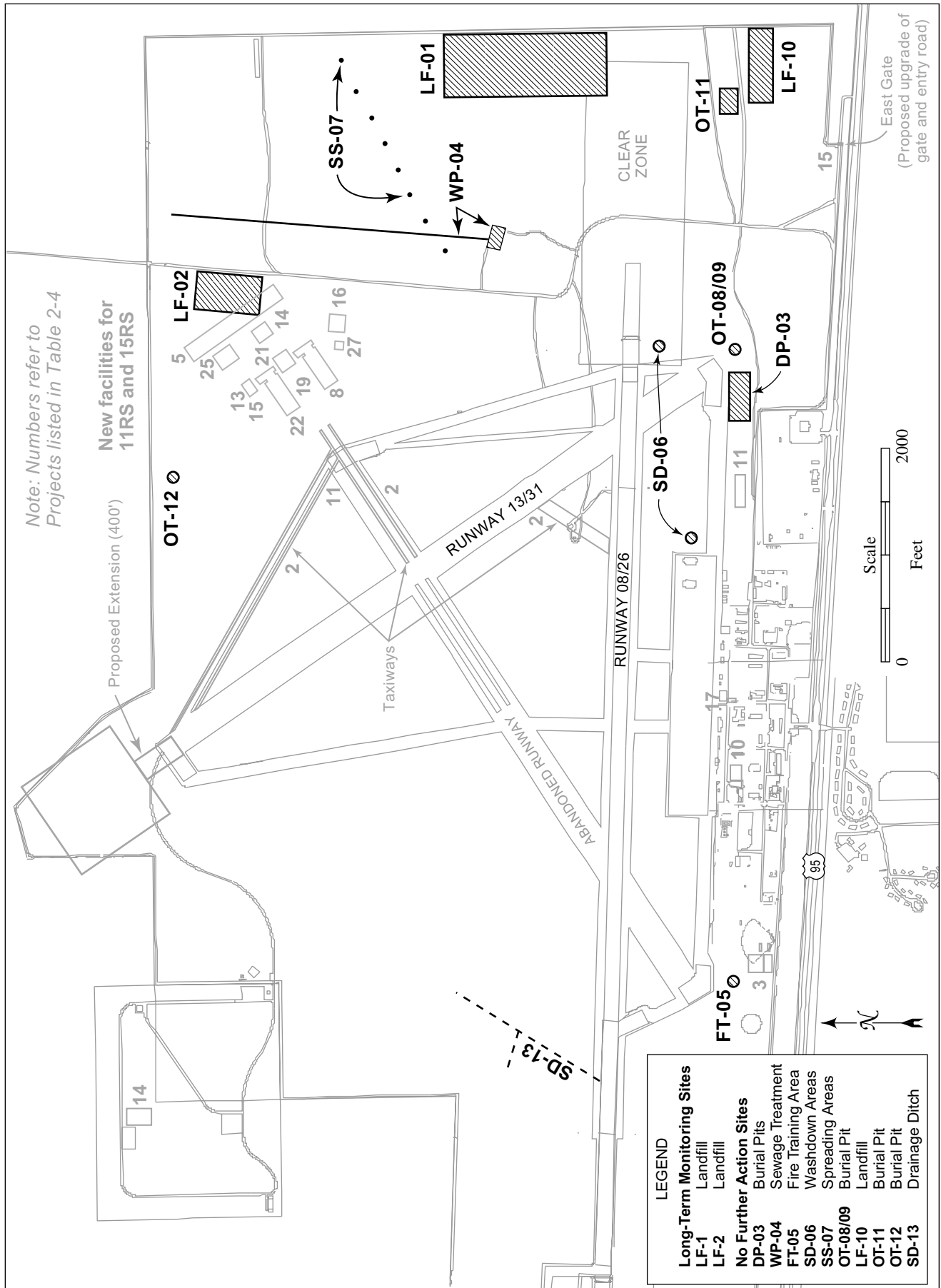


Figure 3.15-1. ERP Sites on Indian Springs AFAF

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